RECORD OF DECISION
SUMMARY OF REMEDIAL ALTERNATIVE SELECTION

ITT THOMPSON INDUSTRIES
SUPERFUND ALTERNATIVE SITE

MADISON, MADISON COUNTY, FLORIDA

PREPARED BY:

U.S. ENVIRONMENTAL PROTECTION AGENCY
REGION 4
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LIST OF ACRONYMS and ABBREVIATIONS

ARAR	applicable or relevant and appropriate requirement
CERCLA	Comprehensive Environmental Response Compensation Liability Act
CFR	Code of Federal Regulations
COC	chemical of concern
COPC	chemical of potential concern
COPEC	chemical of potential environmental concern
CSF	cancer slope factor
cy	cubic yards
EPA	U.S. Environmental Protection Agency
FAC	Florida Administrative Code
FDEP	Florida Department of Environmental Protection
FDER	Florida Department of Environmental Regulation
FS	Feasibility Study
HI	hazard index
HQ	hazard quotient
ILCR	incremental lifetime cancer risk
MCL	maximum contaminant level
µg	microgram
µg/L	micrograms per liter
mg/kg	milligrams per kilogram
mg/kg-day	milligrams per kilogram per day
mg/L	milligrams per liter
M/T/V	mobility/toxicity/volume
NCP	National Contingency Plan
O&M	operation and maintenance
OU	Operable Unit
PAH	polynuclear aromatic hydrocarbons
PCE	tetrachloroethylene
POTW	Public Owned Treatment Works
RCRA	Resource Conservation and Recovery Act
RAGS	risk assessment guidance
RD	Remedial Design
RfC	reference concentration
RAO	Remedial Action Objective
RME	reasonable maximum exposure
RI	Remedial Investigation
ROD	Record of Decision
SARA	Superfund Amendments and Reauthorization Act
"Site"	ITT-Thompson Industries Superfund Alternative Site
SVOC	semi-volatile organic compounds
TBC	to-be-considered

PART 1: THE DECLARATION

1.1 Site Name and Location

This Record of Decision (ROD) is for the ITT-Thompson Industries Superfund Alternative Site, located at 800 Livingston Street (State Road 145) in the City of Madison in Madison County, Florida. The U.S. Environmental Protection Agency (EPA) Site Identification Number for the ITT-Thompson Industries Superfund Alternative Site is FLD043047653.

1.2 Statement of Basis and Purpose

This decision document presents the Selected Remedy for the ITT-Thompson Industries Superfund Alternative Site (the "Site") that was chosen in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA), and, to the extent practicable, the National Contingency Plan (NCP). This decision is based on the Administrative Record for the Site. This decision represents the final remedy selection for the Site, and, following completion of the remedial action, the Site will be ready for reuse. The State of Florida, as represented by the Florida Department of Environmental Protection (FDEP), has been the support agency during the remedial investigation/feasibility study process for the Site. In accordance with 40 Code of Federal Regulations (CFR) Section 300.430, as the support agency, FDEP has provided input during the process.

1.3 Assessment of Site

The response action selected in this ROD is necessary to protect the public health or welfare and the environment from actual or threatened releases of hazardous substances to the environment.

1.4 Description of Selected Remedy

The selected remedy is the excavation and off-site disposal of soil and sediment contamination and the in-situ bioremediation of groundwater contamination through Enhanced Reductive Dechlorination. Following completion of the remedy and establishment of institutional controls, the remedy will be protective of both human and ecological receptors. The Selected Remedy is compatible with the planned future use of the Site. The major components of the Selected Remedy include:

- The excavation, transportation, and off-site disposal of soils and sediments containing contamination at concentrations that exceed the cleanup goals;
- In-situ bioremediation of groundwater using Enhanced Reductive Dechlorination, followed by Monitored Natural Attenuation until cleanup goals are met;
- Institutional controls to ensure that future land use is appropriate to conditions on site until cleanup goals are reached; and
- Five-Year Reviews of the remedy to ensure protectiveness is maintained.

1.5 Statutory Determinations

The Selected Remedy is protective of human health and the environment, complies with Federal and State requirements that are legally applicable or relevant and appropriate to the remedial action (unless justified by a waiver), and is cost effective. This remedy utilizes permanent solutions and alternative treatment technologies to the maximum extent practicable and satisfies the statutory preference for remedies that employ treatment to reduce toxicity, mobility, or volume as a principal element. The remedy eliminates human and ecological exposure to contaminated soil, sediment, ground water, and surface water. The remedy permanently controls the mobility of the contaminants, and is protective of ground water resources. The most significant contaminant in ground and surface water are chlorinated volatile organic compounds, such as trichloroethylene and vinyl chloride. The most significant contaminants in soil and sediment are heavy metals and vinyl chloride. There are no contaminants at levels that constitute a principal threat waste.

Because this remedy will take in excess of five years from construction start to attain unlimited use/unlimited exposure criteria, a statutory review will be conducted within five years of construction of the remedy to ensure that the remedy remains protective of human health and the environment as the cleanup progresses.

1.6 Data Certification Checklist

The following information is included in The Decision Summary, Part 2 of this ROD. Additional information can be found in the Administrative Record file for this Site.

Chemicals of concern (COCs) and their respective concentrations (page 12)
Baseline risk represented by the COCs (page 12)
Cleanup goals established for COCs and the basis for these levels (page 24)
How source materials constituting principal threats are addressed (page 37)
Current and reasonably anticipated future land use assumptions and current and potential future beneficial uses of ground water applied in the Baseline Risk Assessment (BRA) and ROD (page 40)
Potential land and ground water use that will be available at the Site as a result of the Selected Remedy (page 40)
Estimated capital, annual operation and maintenance (O&M), and total present worth costs, discount rate, and the number of years over which the remedy cost estimates are projected (page 40)
Key factor(s) that led to selecting the remedy (i.e. describe how the Selected Remedy provides the best balance of tradeoffs with respect to the balancing and modifying criteria, highlighting criteria key to the decision) (page 29)

1.7 Authorizing Signatures

Franklin E. Hill, Director
Superfund Division
U.S. Environmental Protection Agency, Region 4

9/26/08
Date

PART 2: THE DECISION SUMMARY

2.1 Site Name, Location, and Brief Description

This Record of Decision (ROD) is for the ITT-Thompson Industries Superfund Alternative Site (the "Site"), located at 800 Livingston Street (State Road 145) in the City of Madison in Madison County, Florida. The site location is shown on Figure 1. The U.S. Environmental Protection Agency (EPA) Site Identification Number for the ITT-Thompson Industries Superfund Alternative Site is FLD043047653. The Site consists of the soil, sediment, ground water, and surface water that were contaminated by releases from the ITT Thompson facility.

This Site is a Superfund Alternative Site (SAS). These are sites that require long-term response—remedial action—and are eligible for, but are not listed on, the National Priorities List (NPL). SAS use the same investigation and cleanup process and standards that are used for sites listed on the NPL. The Superfund alternative approach can save the time and resources associated with listing a site on the NPL. This site meets the three criteria for this approach:

- Site contaminants are significant enough that the site would be eligible for listing on the NPL,
- A long-term response (i.e., a remedial action) is anticipated at the site, and
- There is a willing, capable PRP who will negotiate and sign an agreement with EPA to perform the investigation or cleanup.

In November 1998, the potentially responsible party (PRP), ITT Industries, and EPA entered into two Administrative Orders on Consent (AOCs) requiring the PRP to conduct an Expanded Site Investigation (ESI), Remedial Investigation (RI), and Feasibility Study (FS) activities in accordance with CERCLA. The AOCs provide EPA the lead role in the planning, execution, and oversight of the investigation and remedial activities for the Site. Site remediation will be conducted and financed by the PRP under an agreement with the EPA.

2.2 Site History and Enforcement Activities

2.2.1 Operational History

Prior to 1951 and supported by evidence of sawdust and lumber chips described on boring logs, the property is believed to have been used as a lumber mill. The first known manufacturing buildings constructed at the Site were built in 1950. Historically, the Site has been occupied by various tenants as businesses, which include, but are not limited to: Stainless Products; Metal Products Corp / Metal Products, Inc.; Thompson Industries, Inc. / Thompson Metals Division; ITT Thompson Industries; Thompson International; Agri-Products; and ITT Corporation.

In 1951, the property owner, Madison Industries Group (MIG), leased the property to Metal Products Corp. / Metal Products, Inc. In the early 1950's Thompson Metals Division, a wholly owned subsidiary of Thompson Industries, Inc. acquired Metal Products, Inc. and acquired the lease. Sheraton acquired Thompson Industries, Inc. and the lease in 1959. ITT acquired Sheraton in 1968 and the Facility became known as ITT Thompson Industries. In 1989, ITT Thompson Industries sold the business and Thompson International acquired the lease. Thompson International closed the Facility in 1990.

Historically, the facility was used by the various tenants from the 1950s through approximately 1990 for the manufacturing of metal automotive ornamentation components, including auto body trim, grills, wheel covers, and wire wheel products. A review of available historical information indicated that general facility operations included roll forming, stamping, buffing, assembly, welding and painting. Plating was not conducted at the facility. Materials that may have been used at the Site included: diesel fuel, oil, paint, lacquer and paint thinner, mineral spirits, phosphoric acid, caustic stripper, toluene, and trichloroethylene (TCE). It has been documented that TCE was used for a limited period from 1970 – 1974.

MIG leased the Facility to Agri-Products (AP) for the storage of bagged cypress mulch from approximately 1992 to July 2000. As of 2002, ITT has leased the property exclusively so that the ESI/RI activities could continue without obstruction by cypress mulch storage.

2.2.2 Regulatory and Enforcement History

Numerous environmental investigations have been conducted at and around the former Facility, beginning in 1987. A chronology of key work plans and reports related to the Site is presented in Table 1.

In 1994 and 1995, water samples collected from private wells in the Yellow Pines subdivision exhibited concentrations of TCE above the Federal Maximum Contaminant Level (MCL) of 5 µg/L. The September 1996 Preliminary Assessment and the October 1997 Site Investigation indicated that the Site had impacted groundwater with several chlorinated and non-chlorinated VOCs present to depths of at least 70 feet below ground surface (bgs). Site groundwater samples collected exceeded state and federal Primary Drinking Water Standards for six VOCs: benzene; 1,1- DCE; cis-1,2 DCE; TCE; toluene; and VC.

2.2.2.1 Pre-ESI/RI Investigations

The activities that pre-dated the AOCs included preliminary Site assessments conducted by Bryson Industrial Services, Inc. (Bryson) from 1987 to 1990 and by Woodward-Clyde from 1995 to 1997, as well as investigations conducted by or on behalf of FDEP from 1996 to 1997. A brief summary of these investigations is provided below.

Bryson Industrial Services

Bryson conducted investigations at the Site from 1987 through 1990 to comply with a Florida Department of Environmental Regulation (FDER) Consent Agreement dated March 23, 1988 (OGC Case No. 86-111). Surface water and sediment samples were collected from the UNP and soil/sediment samples were collected in a marsh area near the aboveground petroleum storage tanks. Groundwater samples were collected from two temporary monitoring wells. The *Preliminary Contamination Assessment Report (Phase III)* (Bryson, April 1990) concluded "The soils/sediments would not be considered as excessively contaminated under Department of Florida State Underground Petroleum Environmental Response Act." Benzene was the only compound to exceed an FDER standard in groundwater, and it was just above the standard. FDER agreed with the recommendations of the Phase III report for no further action for this area of investigation.

Woodward-Clyde

Woodward-Clyde conducted several phases of investigation at the Site during 1995–1997. In 1996, 23 soil vapor samples were collected from areas within and around the former manufacturing building. Soil vapor samples were collected from a depth of 4 to 4.5-ft below ground level. Chlorinated volatile organic compounds (CVOCs), were detected adjacent to the loading dock on the west side of Building 4. Benzene, toluene, ethylbenzene, and xylene (BTEX) constituents, primarily toluene, were detected at very low concentrations across the Site with the exception of three locations.

A comprehensive soil investigation was conducted by Woodward-Clyde in August 1995, February and August 1996, and May 1997, which is summarized in the *Contamination Assessment Report Addendum II* (Woodward-Clyde, October 1996) and in the *Direct-Push Investigation for Interim Remedial Alternative Assessment* (Woodward-Clyde, July 1997).

In 1995 and 1996 a total of 13 borings were completed and 19 soil samples were collected. The analytical results for these boreholes indicated the presence of BTEX, gas and diesel range petroleum hydrocarbons, and chlorinated hydrocarbons in the soil to the west of the former manufacturing building. The analytical results of the soil samples that were collected from the Site during this investigation identified two suspected source areas that contained elevated concentrations of VOCs: Twelve monitoring wells and three piezometers were installed from August 1995 to August 1996 and indicated VOC contamination in the shallow and intermediate-depth groundwater.

A direct-push groundwater screening program was performed in 1997 by Woodward-Clyde that concentrated on the two suspected source areas. A total of 16 direct-push borings were completed. CVOCs and BTEX constituents were detected in groundwater at elevated concentrations

Florida Department of Environmental Protection

Under the authority of CERCLA and SARA, the FDEP prepared a Preliminary Assessment (PA) in 1996 to summarize the data collected to date. This work consisted of a file review, and no additional fieldwork was conducted. The PA noted the presence of elevated levels of BTEX and CVOCs in soil and groundwater and the detection of TCE in potable wells in the Yellow Pines subdivision. The PA recommended further CERCLA action, including a Site Inspection. E&E subsequently prepared the draft *Site Inspection Work Plan* (June 1997).

Ecology and Environment

A Site-wide groundwater assessment conducted on behalf of the FDEP is documented in the *Site Investigation Report for the ITT Thompson Industries Site* (E&E, October 1997). This investigation identified chlorinated and non-chlorinated VOCs as contaminants of concern (COCs) along with one SVOC (naphthalene) and two metals (aluminum and manganese). E&E also collected two sediment samples from the UNP in June/July 1997. Based on the analytical results, chromium, lead, and potentially zinc were identified as COCs. Results are presented in the *Site Investigation Report for the ITT Thompson Industries Site* (E&E, October 1997).

Expanded Site Investigation / Remedial Investigation (ESI/RI)

On November 13, 1998, ITT and the USEPA entered into two separate AOCs to conduct ESI/RI/FS activities. On ITT's behalf, OBG, and then Earth Tech conducted the ESI/RI from 1998 through 2002.

As a part of the ESI/RI, the Site was characterized using a systematic multi-phased approach. The ESI/RI report, entitled *Combined ESI/RI Report* (Earth Tech, July 2003a) was approved by USEPA on July 29, 2003. The BHHRA and the Combined Screening-Level ERA were included as part of the ESI/RI.

Interim Remedial Measures

In order to comply with the requirements of the Phase I AOC, in 1998, ITT proposed and was given approval by USEPA to conduct a Soil Vapor Extraction (SVE) pilot test to determine the potential effectiveness of SVE in removing VOCs from vadose zone soil, to characterize the quantity and nature of air emissions, and to evaluate the quantity of water generated during SVE operations. Due to the thin nature of the unsaturated zone, groundwater was pulled into the pilot-scale SVE system, and the SVE pilot test was unsuccessful.

Post RI Investigations

Several investigations were undertaken after the submittal and approval of the ESI/RI including the Enhanced Reductive Dechlorination (ERD) Pilot Test, annual groundwater monitoring, UNP toxicity testing and chemical analysis (discussed separately in the FFS for the UNP), an injection test, and supplemental characterization. The additional investigations are summarized below.

Summary of Enhanced Reductive Dechlorination Pilot Study

An ERD pilot test was conducted to evaluate the effectiveness of ERD technology to address groundwater contamination. The pilot test was conducted within the on-Site suspected source area located at the southwest area of the Site starting December 2004 and was intended to last for 18 months. Because of the success of the pilot test, it continues to the present. The results of the pilot test are shown in Figure 15, which compares groundwater contamination before the pilot test and after 28 months of the pilot test The selected remedy for ground water presented in this ROD is the ERD approach. The ERD technology involves the injection of a carbohydrate source to increase the rate at which naturally-occurring bacteria breakdown TCE and other chlorinated organic compounds under anaerobic conditions.

As of the March 2007 sampling, the ERD pilot test has shown:

- Upper Surficial (US) – A 99% reduction in CVOCs in the one US well located in the ERD zone.
- Lower Surficial (LS) – A 56% overall average reduction in CVOCs in four LS wells in the ERD zone.
- Upper Floridan (UF) – A 76% overall average reduction in CVOCs in three UF monitor wells in the ERD zone.

Annual groundwater sampling continues to monitor the distribution of Site-related VOCs in groundwater and identify trends. In 2006, an injection test was conducted to evaluate the method for injections into the LS aquifer. Also, a Supplemental Characterization study included a field-screening investigation to refine the understanding of the current lateral extent of TCE impacts in the LS aquifer zone distribution downgradient of the Facility.

2.3 Community Participation

Community involvement at this site has included issuing fact sheets. EPA issued groundwater use fact sheets in March 2003, March 2004, and April 2005. The announcement of the Proposed Plan public meeting and the notice of the availability of the Administrative Record were published in the Local Newspaper on August 27, 2008. The Proposed Plan was mailed on August 15, 2008. The Public Comment Period for the Proposed Plan was from August 18, 2008 through September 18, 2008. The EPA presented the Proposed Plan to the community at a public meeting on August 28, 2008 at the North Florida Community College located in Madison, Florida with 30 people in attendance. Representatives from EPA, and FDEP listened to questions and comments from the community concerning the proposed remedy and the remedial alternatives evaluated.

The Administrative Record file is available to the public at the Madison Public Library located at 378 N.W. College Loop, Madison, FL 32340 and in the information repository maintained at the EPA Region 4 Superfund Record Center. EPA's responses to the comments received during the public comment period are included in the Responsiveness Summary, located in Part 3 of this ROD. The transcript from the public meeting can be found in the Administrative Record.

2.4 Scope of Remedial Action

This remedial action will eliminate risks to human and ecological receptors from contaminated soil, sediment, ground water, and surface water. The action will be compatible with the planned future reuse of the Site and will complete remedial action at the Site.

2.5 Site Characteristics

2.5.1 Conceptual Site Model

The Conceptual Site Model (CSM) for the Site is presented in Figure 3 and identifies the source of contamination, how the contamination was released, what media was affected and the exposure route to affected receptors. In brief, former manufacturing activities resulted in the release of contaminants from spills, and contaminated storm water runoff. Contaminants leached from soils into ground water. A chemical spill into the UNP occurred and resulted in the contamination of the UNP sediments. Contaminated ground water discharges into the surface water in Mill Pond. The CSM was used to help identify the exposure routes that were further examined in the risk assessment.

2.5.2 Site Overview

The former facility occupies approximately 4.66 acres and includes a 107,725 square foot former manufacturing facility. The majority of the former facility not occupied by structures is paved with asphalt or concrete. A chain link fence with locking gates surrounds the former facility, which is currently vacant.

2.5.3 Regional Physiography and Topography

The Site is located within the Tallahassee Hills subunit of the Northern Highlands, as defined by Puri and Vernon (1964). Weathering has played a key role in shaping the topography of the Tallahassee Hills geomorphic division in Madison County. The central and northern portions of Madison County have numerous small lakes and ponds located in closed karst depressions that developed from the dissolution of the underlying limestone and subsequent subsidence of overlying sediments. The Site has two known

karst features – sinkholes, or cover collapse features. One cover collapse feature is located adjacent to the source area and the other is north of the plume.

The general stratigraphy of the region and the site is shown in Figure 4. The geology consists of undifferentiated sands and clay, underlain by the Miccosukee Formation sediments. The Miccosukee Formation overlies the Hawthorn Group. The Hawthorn Group sediments present at the site consist of the Torreya Formation, a layer of pale olive to moderate yellow, sandy, phosphatic clays and sands. Beneath the Torreya Formation, are the recrystallized limestone sediments of the St. Marks Formation and the Suwannee Limestone, which is a fossiliferous marine limestone. The Suwannee Limestone overlies the carbonates of the Ocala Group. The Ocala Group limestones are comprised of dolomitic limestone that is either partially or completely recrystalized (Hoenstine et al., 1990). The top of the Ocala Group was encountered at approximately 180 feet bgs (-41 feet below msl).

2.5.4 Hydrogeology

Three distinct hydrologic features have been identified in Madison County: 1) the Surficial Aquifer System, 2) the Intermediate Confining Unit, and 3) the Floridan Aquifer System. At the site, there are three levels of groundwater. The aquifer at the Site is also influenced by cover collapse features. A cross-section of the aquifer is depicted in Figure 5.

Surficial Aquifer

The Surficial Aquifer consists of upper portions of the Miccosukee Formation underlain by the more recent undifferentiated surface sediments. The surficial aquifer is divided into Upper Surficial (US) aquifer and Lower Surficial (LS) aquifer, which are connected, but demonstrate different characteristics. The LS has a much greater horizontal gradient than the US. Discharge from the Surficial Aquifer is both vertically downward and lateral; the downward discharge is a source of recharge to the underlying Floridan Aquifer systems, and the lateral discharge is into the topographically lower areas (Hoenstine *et al.*, 1990).

Intermediate Confining Unit

The Torreya Formation forms an Intermediate Confining Unit in the area. Where the confining beds are discontinuous or leaky, the Intermediate Confining Unit is recharged from the overlying Surficial Aquifer. Leakage from the Intermediate Confining Unit is vertically downward into the Floridan Aquifer system or horizontally to local surface water bodies (Hoenstine *et al.*, 1990). The thickness of this clay layer typically ranges from about 10 to 40 feet.

Floridan Aquifer System

The Floridan Aquifer system is the principal potable groundwater source for much of Florida. At the Site, the Upper Floridan (UF) Aquifer corresponds to an epikarst layer or the top of the Suwannee Limestone.

Cover Collapse Features

There are two known cover-collapse sinkholes at the site. Cover-collapse sinkholes are formed by the dissolution of the limestone underlying the surface soils. A cavity develops in the underlying limestone

with the soils above forming a "bridge". When this "bridge" collapses, the material above the cavity collapses into the void. Over time, the sinkhole is filled with sediment deposited at the surface. At the site, the cover-collapse features are characterized by the absence of the Torreya Formation, the epikarst layer and the Suwannee Formation. A cross section of the cover-collapse feature near the source area is depicted in Figure 6.

2.5.5 Nature and Extent of Contamination

The investigation of the site occurred over many years and in a phased approach. The initial sampling effort included analysis for many constituents. As more information was gathered, the sampling effort became more focused.

2.5.5.1 Nature and Extent of Soil Impacts

TCE and BTEX was released to the soil behind the former manufacturing facility. Arsenic contamination has been detected in the former facility surface and subsurface soil and in one surface soil sample. Figure 7 shows the soil and subsurface soil contamination.

2.5.5.2 Nature and Extent of Sediment Impacts

The sediment in the Unnamed Pond is contaminated by chromium, lead, zinc, and bis(2-ethylhexyl)phthalate) from a release of material through a storm drain emptying into the pond. Nearby retention ponds and the low lying area between the retention ponds and Mill Pond are not contaminated. Sediments are evaluated in the Focused Feasibility Study (FFS) for the Unnamed Pond (ARCADIS, 2005). Figure 8 shows the concentrations of contaminants in the UNP sediments.

2.5.5.3 Nature and Extent in the Surficial Aquifer

Concentrations of benzene, TCE, cis-1,2-DCE and VC detected in the US are limited in areal extent to the suspected source area west of the former manufacturing facility with the exception of the low concentrations of TCE and cis-1,2-DCE detected near Mill Pond. The concentrations detected at this location are believed to be the result of upward migration of impacted groundwater from the LS. Site-related COCs within the US have migrated both horizontally and vertically through the US into the LS. Figure 9 shows the concentration of TCE in the LS.

In the LS, the CVOCs TCE, cis-1,2-DCE and VC are present. Groundwater transport of COCs away from the suspected source area in the LS is primarily horizontal, above the top of the Torreya Formation confining bed. Groundwater in the LS migrates to the southeast and is channeled due to subsurface features of the aquifer. These features restrict contaminant migration to within this narrow area. The flow path then widens on the other side of this area and moves to the east. The LS groundwater has an upward gradient on the west side of Mill Pond and is suspected to discharge into Mill Pond. Figure 10 shows the concentration of TCE in the US.

2.5.5.4 Nature and Extent in the Upper Floridan Aquifer

TCE, cis-1,2-DCE, and VC are present in the UF. The contaminants migrated laterally to the east and northeast along regional flow lines. There are upward vertical hydraulic gradients present in the deeper

(200 feet bgs) portions of the UF which confirm that further downward migration is unlikely. Figure 11 shows the concentration of TCE in the UF

2.5.5.5 Nature and Extent in the Cover-Collapse Features

CVOCs occur in the cover-collapse feature near the UNP where the Torreya Formation is absent. The cover-collapse feature has been filled with a low-permeability clayey sand material which limits downward migration of groundwater from the LS; however, it is suspected that there are more permeable zones that act as preferential pathways for groundwater to move from the LS to UF. TCE, cis-1,2-DCE, and VC are the identified COCs in the OBGMLP32 cover-collapse feature area.

The ratio of cis-1,2-DCE to TCE in the cover-collapse feature groundwater prior to initiation of the ERD pilot test indicates that groundwater within the collapse feature has a different chemistry compared to the LS outside the collapse feature. The groundwater in the collapse feature prior to implementation of the ERD pilot test contained a cis-1,2-DCE to TCE ratio of between 90 and 15000 to 1 compared to the cis-1.2-DCE to TCE ratio of between 1 and 60 to 1 observed in the LS outside the collapse feature. Additionally, the decreases in pH and alkalinity observed in the cover collapse feature after carbohydrate injections were initiated also indicate that the groundwater within the collapse feature has a different chemistry with less buffering capacity. These chemistry differences and the hydrogeologic differences discussed earlier support characterizing the cover-collapse feature as a semi-confining unit that underlies the LS in the immediate vicinity of the collapse feature.

2.5.5.6 Nature and Extent of Surface Water Impacts

VC slightly exceeded screening levels in one of the six surface water samples. This sample was collected along the western edge of Mill Pond. This pond is located hydraulically downgradient of the former facility. The VC concentration in Mill Pond may be the result of groundwater transport from the LS where VC is present. VC has not been detected in the US in this area. In this area, the vertical gradient within the Surficial Aquifer is upward from the LS to the US.

2.6 Current and Future Land and Water Uses

2.6.1 Current and Future Land Use

The former facility is currently leased by ITT Industries to ensure accessibility for the remedial investigation and action. The buildings from the former facility are in very poor condition. More than 95 percent of the facility property is covered by buildings, asphalt, or concrete. The land use of the area surrounding the former facility includes low to medium density residential neighborhoods, a shopping center, commercial and service businesses, an auto graveyard, temperate hardwoods, natural ponds, storm-water retention ponds and improved pasture. During remedial design, restricting future land use to light industrial or commercial will be evaluated. If land use restrictions are not possible, residential use will be assumed. The excavation of contaminated soils will be protective under the appropriate future land use, whether it is industrial or residential land use. The volume of soil to be excavated will be determined during remedial design, depending on the appropriate cleanup goal.

2.6.2 Current and Future Ground Water and Surface Water Use

There is no current use of ground water contaminated by this site because local ordinance requires city residents to hook up to the municipal water supply. On April 21, 1999, Madison County passed Ordinance 108 on Water System Connections. This ordinance requires all new homes within 200 feet of a water line to connect to public water. Future ground water use is restricted because of the ground water contamination. Once the clean up goals are met, ground water use restrictions may be lifted for irrigation or drinking water.

2.7 Summary of Site Risks

To determine whether a Superfund Site poses a current or potential threat to human health and the environment, a baseline risk assessment is conducted which examines the risk associated with taking no cleanup action. The risk assessment provides the basis for taking action and indicates the exposure pathways to be addressed by the remedial action. This section provides a summary of the risks to human health and the environment posed by the Site.

A Baseline Human Health Risk Assessment (BHHRA) was completed to assess the risk to human health from the site (Earth Tech, July 2003a). A Combined Screening-Level Ecological Risk Assessment (ERA) was conducted to evaluate the ecological risk from the Site (Earth Tech, February 2003). The BHHRA and the Combined Screening-Level ERA were included as part of the ESI/RI.

2.7.1 Summary of Baseline Human Health Risk Assessment (BHHRA)

2.7.1.1 Identification of Chemicals of Concern

The selection of The Contaminants of Potential Concern (COPCs) is a step-wise process that evaluates appropriate analytical data to identify those chemicals that are "likely to be Site-related" (i.e., not present at the BHHRA study area due to natural conditions or detected in samples due to field or laboratory error) and that have a potential to pose risk or hazard to human receptors. If a chemical is selected as a human health COPC, it does not imply that the chemical poses a health risk or that it will contribute to a significant risk in an environmental medium. The COPCs are simply those chemicals that need to be further evaluated in the BHHRA to determine their potential effects on current and/or potential future human receptors associated with the BHHRA study area.

The data used in the BHHRA were collected during the Combined ESI/RI/FS activities, as presented in the PSCR (OBG, October 2001b) and the Semi-Annual Groundwater Monitoring Report (Earth Tech, August 2002).

Human exposures were evaluated based on a reasonable maximum exposure (RME), the maximum exposure that is reasonably expected to occur at a Site. Chemical-specific intakes and EPA toxicity values were used to calculate the cancer risk or non-cancer hazard quotient associated with each chemical for each exposure pathway. EPA Region 4 has generally indicated that risks falling within the range of 1E-6 to 1E-4 should be evaluated to determine if risk reduction is feasible. Risks greater than one excess cancer in one million people (1E-6) are considered potentially significant by FDEP, and this benchmark was used for determining COCs. Therefore, those COCs identified as contributing significantly (chemical-specific risk that equals or exceeds 1E-6) to a medium with a total cancer risk of 1E-6 or greater were identified as COCs.

If the noncancer hazard quotient (HQ) exceeds 1, there may be concern for potential noncarcinogenic adverse health effects. The HQs for individual chemicals were summed for each exposure pathway to create a pathway-specific hazard index (HI) for each exposure scenario. Where a pathway-specific HI exceeds 1, the HQs were considered based on critical effect (target organ or system affected most). If a particular COC was determined to contribute significantly (HQ of 0.1 or greater) to a critical effect HI of greater than 1 for a particular pathway, it was identified as a COC. HQs and HIs equal to or less than 1 generally indicate no human health concerns.

For those chemicals that were identified as COCs, a weight-of-evidence evaluation based on frequency of detection, uncertainty in concentrations, and relationship to background concentrations was performed to determine the final COCs, the risk drivers that have the potential to pose significant risk to human receptors and, therefore, need to be addressed in the Site remediation process.

Final COCs (risk drivers) were identified in BHHRA study area soil, Mill Pond surface water, and groundwater (Table 2). They include five VOCs (1,4-dichlorobenzene, benzene, cis-1,2-DCE, TCE, and VC) and one inorganic (arsenic). The primary risk drivers are the chlorinated solvents, in particular TCE and VC, in groundwater. The greatest carcinogenic risks are 9.3E-3 and 2.0E-2 for TCE and VC, respectively, in on-Site surficial aquifer groundwater for the potential future adult resident. The highest non-carcinogenic indices are 166 and 22 for TCE and VC, respectively in on-Site surficial aquifer groundwater for the potential future child resident.

2.7.1.2 Exposure Assessment

The risk assessment process relies on the concept that an exposure pathway must exist, or human risks are not present. A complete pathway includes a chemical source and release mechanism, a transport or retention medium, an exposure point where human contact with the contaminated medium occurs, and a route of intake for the contaminant into the body at the exposure point. If any one of these elements is missing, the pathway is incomplete and is not considered further in the risk assessment.

The exposure assessment addresses the potential pathways by which human populations may be exposed to the human health COPCs associated with the BHHRA study area. The exposure assessment describes exposure scenarios, develops information on exposure pathways, estimates the concentrations of COPCs at points of human exposure, and calculates receptor intakes. A human health conceptual site model (CSM) was developed to illustrate the potential exposure pathways for the BHHRA study area, as presented in Figure 3.

The BHHRA study area data from the Combined ESI/RI/FS activities are used to calculate exposure point concentrations (EPCs). Human exposures are evaluated based on a reasonable maximum exposure (RME), the maximum exposure that is reasonably expected to occur at a site. The RME is a conservative exposure case that is within the range of possible exposures for each potentially complete pathway. Detailed analysis of the selection of exposure point pathways and RME exposure point concentrations for COPCs by medium is presented in Tables 4-1 through 4-13 from the BHHRA, included in Appendix A Risk Assessment Summary.

2.7.1.3 Toxicity Assessment

The objective of the toxicity assessment is to weigh available evidence regarding the potential for

each COPC to cause adverse health effects in exposed individuals and to provide, where possible, an estimate of the relationship between the extent of exposure and the severity of the adverse effects. Toxicological data for the COPCs, including carcinogens and noncarcinogens, are presented in Tables 5-1 through 5-5 from the BHHRA, included in Appendix A Risk Assessment Summary.

For carcinogens, the slope factor (SF) is used in risk assessments to estimate an upper-bound lifetime probability of an individual developing cancer as a result of exposure to a particular level of a potential carcinogen (over and above the level an individual is expected to be exposed to under normal conditions). The term "upper bound" reflects the conservative estimate of the risks calculated from the SF. Use of this conservative approach makes underestimation of the actual cancer risk highly unlikely. SFs are derived from the results of human epidemiological studies or chronic animal bioassays to which animal-to-human extrapolation and uncertainty factors have been applied.

For noncarcinogens, a reference dose (RfD) is the toxicity value used most often in evaluating noncarcinogenic effects. RfDs are developed and verified by EPA and are defined as "an estimate of a daily exposure level [to a specific chemical] for the human population, including sensitive subpopulations, that is likely to be without an appreciable risk of deleterious effects during a lifetime". RfDs are reported as an amount of chemical intake (mg/kg-day).

2.7.1.4 Risk Characterization

This section presents the human health cancer risks and chemical hazard estimates for the current land use and hypothetical future land use scenarios for the BHHRA study area. Table 3 provides a concise summary of risks and hazards for each receptor and exposure medium. Risks and hazards are summarized across pathways and media in the "Summary of Receptor Risks and Hazards for COPCs" Tables 6-1 through 6-33

Table 4 provides a concise summary of the risks associated with the COCs. Table 4 is a summary of Tables 6-35 through 6-64 from the BHHRA, which are included in Appendix A, Risk Assessment Summary.

Cancer risks are estimated as the incremental probability of an individual developing cancer over a 70-year lifetime from exposure to carcinogenic contaminants. The risk estimate is the lifetime average daily dose multiplied by the carcinogenic SF. Risks could be estimated only for those COPCs with a SF currently available from IRIS or HEAST or with an interim or provisional value available from the SHRTSC-NCEA. The carcinogenic risk estimate is generally an upper-bound estimate because the SF is typically derived as the upper 95th percentile confidence limit of the probability of response based on experimental animal data (EPA, December 1989). Thus, EPA is reasonably confident that the "true risk" will not exceed the risk estimate derived through use of the SF and is likely to be less than that predicted (EPA, December 1989).

EPA considers individual excess cancer risks in the range of 1×10^{-4} to 1×10^{-6} as protective; however, the 1×10^{-6} risk level is generally used as the point of departure for setting remedial cleanup goals at Superfund sites. EPA's definition of acceptable risk is found in 40 CFR 300.430(e)(2). The point of departure risk level of 1×10^{-6} expresses EPA's preference for remedial actions that result in risks at the more protective end of the risk range. Risks greater than one excess cancer in one million people 1×10^{-6} are considered potentially significant by FDEP. The FDEP benchmark is used here for determining COCs. Therefore, those COPCs identified during the risk

characterization as contributing significantly (chemical-specific risk that equals or exceeds 1 x 10^{-6}) to a medium with a total cancer risk of 1 x 10^{-6} or greater are identified as COCs.

Noncarcinogenic effects were evaluated by comparing an estimated exposure level (dose) over a specified time period with a RfD derived for a similar exposure period. To evaluate the noncarcinogenic effects of exposure to contaminants, the HQ is calculated. The HQ is the ratio of the estimated dose to the RfD. If the estimated dose exceeds the RfD (HQ exceeds 1), there may be concern for potential noncarcinogenic adverse health effects. The HQs for individual chemicals are summed for each exposure pathway to create a pathway-specific HI for each exposure scenario. Where a pathway-specific HI exceeds 1, the HQs should be considered based on critical effect. Critical effect is represented by the target organ, which is the organ or system that is affected most (i.e., experiences critical effects) by exposure to a specific COPC. If a particular COPC was determined to contribute significantly (HQ of 0.1 or greater) to a critical effect HI of greater than 1 for a particular pathway, it is identified as a COC. HQs and HIs equal to or less than 1 generally indicate no human health concerns.

Twelve exposure groups (four soil, two surface water, two sediment, three groundwater, and one fish tissue) and six receptors (current adolescent trespasser, current adolescent resident, current adult and child resident, future industrial worker, future adolescent resident, and future adult and child resident) are evaluated for the BHHRA study area.

2.7.1.5 Uncertainty Analysis

The evaluation of chemical risks to human health is, by necessity, based on a number of assumptions with inherent uncertainties. This section provides a discussion of the uncertainties associated with key study area-related variables and major assumptions used in this assessment, in order to address their potential effect on the resulting risk and hazard estimates.

Chemicals of Potential Concern

The sampling data collected at any study area location are inevitably a limited subset of the nearly unlimited quantity of data that potentially could be collected and, as such, may not be completely representative of site-contaminant levels. Samples used in this BHHRA were not collected randomly and may be biased toward overestimation of chemical concentrations.

Those analytes not detected in any samples in a particular medium or exposure group were eliminated from the data set. There is the possibility that some chemicals thus eliminated actually may be present at levels below their detection limit and that these levels may be above criteria or risk-based screening levels for the chemical. The laboratory methods used in analyzing the samples provide essentially the lowest MDLs and RLs practicable. Therefore, the occurrence of such a situation for certain chemicals is a possibility and may result in underestimation of risks in the BHHRA. However, the significance of such chemicals at consistently low concentrations (never above the detection limit) to the overall risk posed by contaminants at the BHHRA study area is expected to be minimal.

Surface water and sediment data collected from six locations, including the Unnamed Natural Pond, Retention Ponds 1 and 2, and the wooded wetland area immediately south of the Site between these ponds, are used to represent BHHRA study area fresh surface water and sediment for the Unnamed Natural Pond Area exposure group. However, Retention Ponds 1 and 2 receive storm water runoff from

the adjacent commercial and residential areas to the west and south of the Site, subsequently discharging into the adjoining wetland area. The ponds are not expected to receive discharge from the Site and, therefore, are not considered to be impacted by Site-related contamination. However, consistent with the Final Combined ESI/RI/FS Work Plan (OBG, July 1999a; July 1999b) and Combined Screening-Level ERA (Earth Tech, October 2002) and per the request of EPA, these two retention ponds are conservatively addressed in the BHHRA in order to account for potential surface water and sediment exposures in the vicinity of the Unnamed Natural Pond Area. Inclusion of these two ponds would tend to overestimate risk associated with the BHHRA study area.

In accordance with current EPA Region 4 guidance (EPA, May 2000), areas in which sediments are continually covered by water are considered to be incomplete exposure pathways for human receptors. As such, sediment exposures are considered to be potentially complete only in those areas within the ponds in which sediment may be exposed either continuously or during a portion of the year. Although most of the sediments associated with Mill Pond and Retention Pond 2 are typically continually covered by water (e.g., in the vicinity of OBGSE4 and OBGSE16), the area along the edges of these ponds may become exposed during seasonal dry periods characterized by drought conditions. During such periods, little to no surface water also may be present within the Unnamed Natural Pond, Retention Pond 1, and the wooded wetland area between the ponds. Based upon these considerations, the BHHRA conservatively assumes that all sediments from within these ponds may be potentially exposed; therefore, all sediment samples collected within the BHHRA study area during the Combined ESI/RI/FS sampling activities are included in the BHHRA data set. This assumption is likely to overestimate risks.

Uncertainty also is inherent in the selection of COPCs. Uncertainty in contaminant identification is considered low because sampling protocol generally targets appropriate analytes based on historical information and guidance. Reasonable certainty also is assumed because of the sample data validation and QA/QC procedures applied to sample analysis and data evaluation. The maximum of either the normal or duplicate result without consideration of data qualifiers was conservatively used to represent the maximum detected concentration for purposes of COPC identification, which may tend to overestimate risk. Eliminating contaminants in the COPC screening process can lead to lower estimates of potential health effects than would inclusion of all analytes. However, other than EHNs, almost all of the chemicals excluded from the risk assessment were those detected at concentrations below conservative risk-based screening levels. Antimony in surface soil (exposed and unexposed); mercury in Unnamed Natural Pond surface water; chromium and vanadium in Mill Pond surface water; and aluminum, barium, and iron in Mill Pond sediment were eliminated as COPCs in those exposure groups based on a comparison to background. The methods used to identify COPCs could result in an overestimation or underestimation of risk.

There is uncertainty associated with the background data sets. Background samples collected include six surface and subsurface soil samples, five surface water and sediment samples (including three locations from Lake Francis and two locations from Mill Pond), and three groundwater samples (two samples from the Surficial Aquifer and one sample from the Floridan Aquifer). With the exception of the soil samples, each of these background data sets is relatively small, consisting of less than five samples. The limited number of background samples increases uncertainty. However, all surface water, sediment, and groundwater background concentrations used in this BHHRA are conservatively based on the mean concentration [i.e., two times the mean background concentration was only calculated for surface and subsurface soil data sets, since statistical evaluation was not considered appropriate for the remaining data sets, where the sample size (n) is less than 5]. All of these data are used as part of the lines of evidence to determine if measured BHHRA study area concentrations of naturally-occurring inorganics

are representative of background levels. Use of a background comparison could over- or underestimate risk, depending on how well the background was characterized. However, use of the mean or two times the mean compared to maximum detected concentration is conservative and most likely would not lead to an underestimation of risk.

The background surface water and sediment samples collected from Lake Francis are used for comparison to BHHRA study area surface water and sediment samples collected from the Unnamed Natural Pond Area. However, these wetland areas represent different types of water bodies (i.e., Lake Francis is designated as a lacustrine wetland, whereas the Unnamed Natural Pond is designated as a palustrine wetland). Furthermore, Retention Ponds 1 and 2 are not designated wetlands, but are man-made features providing storm water drainage for nearby commercial and residential properties and not the facility. However, due to a lack of more appropriate background locations, these locations were determined by EPA to be the most relevant to the potentially site-impacted locations. Consequently, these considerations are likely to increase uncertainty associated with the comparison of these data sets and most likely would contribute to an overestimation of risk.

The lack of risk-based screening levels for some of the analytes detected in the BHHRA study area exposure groups increases the uncertainty in COPC identification. Surrogate screening values from chemicals with similar chemical structures and toxicological effects to humans were used as surrogate values for chemicals detected in all of the soil, surface water, sediment, and groundwater exposure groups. The use of surrogate screening values may overestimate or underestimate risk.

Exposure Assessment

Factors that contribute to uncertainty in the exposure assessment include identification of exposure pathways; assumptions for scenario development, intake parameters, and exposure pathways; and derivation of exposure point concentrations.

The identification of potential exposure pathways and receptors was based on study area-specific, plausible, current and hypothetical future land uses. Study area-specific receptors were identified to the extent possible and exposure parameters were tailored to these receptors to minimize uncertainty in the postulated exposure scenarios and the exposure assessment. The exposure parameters are generally based on conservative assumptions and would tend to overestimate rather than underestimate risk.

Values assumed for exposure parameters (e.g., IR and EF) used in calculations of intakes were primarily standard default values based on EPA guidance (EPA, March 1991; August 1997; and May 2000). These assumptions might result in underestimating or overestimating the intakes calculated for specific receptors, depending on the accuracy of the assumptions relative to actual site conditions and land uses. In the case of dermal exposure, there is uncertainty associated with the conversion from an administered intake to an absorbed dose because of uncertainty associated with the conversion factors.

In the derivation of exposure point concentrations, the inclusion of one-half the RL as a proxy concentration for chemicals detected below the RL may overestimate risks. Non-detects were addressed in a different manner for the calculation of background concentrations for organics (PAHs, PCBs, and pesticides). (Background comparison for organics is performed as part of the weight of evidence evaluation for identification of final COCs.) This is not common practice for EPA BHHRAs. However, in consultation with EPA Region 4 Office of Technical Services, such an assumption has been made and agreed upon for this site.

Modeling was used to estimate the transfer of contaminants from one medium to another for airborne soil particulates, soil volatiles in air, and fish tissue. (Fish tissue modeling was used for all Mill Pond surface water COPCs.) Exposure point concentrations for soil particulates were derived using particulate emission factors based on simplified soil-to-air transmission relationships and estimated study area-specific factors. The soil-to-air volatilization factors used to estimate air exposure point concentrations for soil VOCs, similarly based on simplified soil-to-air transmission relationships, are chemical-specific and were derived based on the size and climate zone of the BHHRA study area and the exposure interval. Use of the PEFs and VFs introduces uncertainty into the risk assessment that may over- or underestimate risk, depending on how well the models predict actual concentrations. The use of food chain modeling to derive exposure point concentrations for chemical residues in fish tissue also contributes to uncertainty. Concentrations in sport fish tissue were estimated by multiplying the Mill Pond surface water concentration by the aquatic BCF for that COPC and by a FCM based on the Kow and the trophic level of the prey on which the sport fish is feeding. The use of BCFs and FCMs tends to overestimate the fish tissue exposure point concentrations and the associated risk.

The maximum detected concentration was used as the exposure point concentration when calculating risk and hazard for six of the eight COPCs in surface soil (exposed) (aluminum, arsenic, chromium, copper, iron, and naphthalene); one of the 19 COPCs in surface soil (exposed and unexposed) (benzo(a)pyrene); three of the eight COPCs in subsurface soil (exposed) (chromium, copper, and naphthalene); one of the 22 COPCs in subsurface soil (exposed and unexposed) (benzo(a)pyrene); seven of nine COPCs in Unnamed Natural Pond surface water (4,4'-DDD, 4,4'-DDT, alpha-chlordane, beta-BHC, gamma-chlordane, iron, and manganese); five of five COPCs in Mill Pond surface water and fish tissue (bis(2-ethylhexyl)phthalate, beta-BHC, cis-1,2-dichloroethene, iron, and vinyl chloride); four of 10 COPCs in Unnamed Natural Pond sediment (benzo(a)pyrene, benzo(b)fluoranthene, chromium, and indeno(1,2,3-cd)pyrene); the one COPC in Mill Pond sediment (vanadium); six of 14 COPCs in on-Site Surficial groundwater (1,4-dichlorobenzene, chloroform, iron, heptachlor, manganese, and naphthalene); two of 13 COPCs in off-Site Surficial groundwater (beta-BHC and iron); and four of the seven COPCs in off-Site Floridan groundwater (bis(2-ethylhexyl)phthalate, chloroform, chromium, and vinyl chloride). This conservative default value was used for these COPCs because the calculated UL95 was greater than the maximum detected concentration. The use of maximum detected concentrations as exposure point concentrations may result in elevated risk and hazard levels and overestimation of risk.

The arithmetic average of the concentrations detected in samples from the highly concentrated area of the groundwater plume was used as the exposure point concentration for the VOC COPCs in each of the three groundwater exposure groups. This may increase uncertainty in the BHHRA as a result of the assumptions made in identification of the highly concentrated area of the plumes. However, examination of the data to identify the highly concentrated area of the plumes revealed elevated concentrations in comparison to the remaining wells in each exposure group. Use of these average concentrations would tend to overestimate the potential risk due to groundwater exposure to VOCs.

Groundwater data used in the BHHRA (from the on-Site and off-Site Surficial Aquifers and the off-Site Floridan Aquifer) were collected from existing monitoring wells during the quarterly sampling event in December 2001 (Event #5) conducted as part of the Combined ESI/RI/FS sampling activities. Three additional quarterly groundwater sampling events, in April, June, and September 2002 (Events # 6, #7, and #8, respectively), have been conducted since work on the BHHRA was begun. The 2002 data were examined to estimate if the 2002 data would have an effect on the conclusions of the BHHRA.

For the on-Site Surficial Aquifer, 22 analytes were detected in groundwater sampling Events #6, #7, and #8 that had not been detected in Event #5 in December 2001. Seventeen of these analytes had a maximum detected concentration less than the risk-based screening level: 1,1,1-trichloroethane, xylenes (total), 1,2-dichlorobenzene, 2,4-dimethylphenol, 4-chloroaniline, acenaphthene, diethyl phthalate, di-n-butylphthalate, di-n-octylphthalate, fluorene, copper, mercury, vanadium, alpha-endosulfan, gamma-BHC, gamma-chlordane, and methoxychlor. One analyte, arsenic, had a maximum that exceeded the risk-based screening level but was less than the background concentration. Three of the four remaining analytes (chloroethane, 2-methylnaphthalene, and alpha-BHC) had a maximum concentration greater than the risk-based screening level for one sampling event (Event #6), but were below the screening level or not detected in the other sampling events. The remaining analyte, thallium, would be identified as a noncarcinogenic COC for the current and future adult and child residents on the basis of the September 2002 (Event #8) data, but it was not detected in April (Event #6) or June (Event #7).

For the off-Site Surficial Aquifer, 18 analytes were detected in groundwater sampling Events #6, #7, and #8 that had not been detected in Event #5 in December 2001. Twelve of these analytes had a maximum detected concentration less than the risk-based screening level: acetone, chloromethane, toluene, xylenes (total), diethyl phthalate, di-n-butylphthalate, di-n-octylphthalate, beryllium, copper, silver, vanadium, and alpha-endosulfan. One analyte, arsenic, had a maximum that exceeded the risk-based screening level but was less than the background concentration. The five remaining analytes (1,2-dichloroethane, chloroform, 1,4-dichlorobenzene, antimony, and thallium) had a maximum concentration greater than the risk-based screening level. Two of these analytes, antimony and thallium, would be identified as noncarcinogenic COCs for the future adult and child residents on the basis of the September 2002 (Event #8) data.

For the off-Site Floridan Aquifer, seven analytes were detected in groundwater sampling Events #6, #7, and #8 that had not been detected in Event #5 in December 2001. Six of these analytes had a maximum detected concentration less than the risk-based screening level: acetone, cobalt, copper, vanadium, beta-BHC, and gamma-BHC. The remaining analyte, thallium, had a maximum that exceeded the risk-based screening level but was less than the background concentration. Therefore, none of these analytes would be identified as COPCs on the basis of the 2002 groundwater data from Events #6, #7, and #8.

In regard to analytes that had been detected in the December 2001 (Event #5) data set, the April, June, and September 2002 (Events #6, #7, and #8) groundwater data were examined to determine if the BHHRA conclusions for any of these analytes would change. No additional COCs would be identified using the 2002 groundwater data. Three chemicals identified as COCs based on the December 2001 groundwater data and subsequently eliminated as final COCs through the weight of evidence evaluation were not detected in any of the 2002 sampling events (i.e., heptachlor in on-Site Surficial, dieldrin in off-Site Surficial, and chloroform in off-Site Floridan groundwater).

Toxicity Assessment

Uncertainty is inherent in the toxicity values utilized in evaluating the carcinogenic and noncarcinogenic risks. Such uncertainty is chemical-specific and is incorporated into the toxicity value during its development. For example, an uncertainty factor may be applied for interspecies and intrahuman variability, for extrapolation from subchronic to chronic exposures, or for epidemiological data limitations. Application of uncertainty factors is expected to overestimate risks.

The use of provisional values from SHRTSC-NCEA for eight COPCs (the oral SF for trichloroethene; 1,4-dichlorobenzene, benzo(a)pyrene, bis(2-ethylhexyl)phthalate, and trichloroethene inhalation SFs; 1,4-dichlorobenzene, aluminum, benzene, iron, and trichloroethene oral RFDs; and aluminum, benzene, and chloroform inhalation RFDs) contributes uncertainty that may over- or underestimate risk. Also, the absence of toxicity values for some of the COPCs may tend to underestimate risks and hazards. Oral/dermal RfDs are not available for four of the 40 COPCs, and inhalation RfDs are not available for 18 of the 29 COPCs for which the inhalation route is applicable (i.e., the COPCs in soil and the VOC COPCs in groundwater). In addition, surrogate toxicity values are used for six carcinogenic COPCs and ten noncarcinogenic COPCs. The use of surrogate toxicity values introduces uncertainty into the risk assessment and may over- or underestimate risk. However, the alternative of not quantitatively evaluating those COPCs would have resulted in greater uncertainty.

The oral and inhalation SFs for benzo(a)pyrene were used as surrogate toxicity values for the two carcinogenic PAHs that are COPCs: benzo(b)fluoranthene and indeno(1,2,3-cd)pyrene. A TEF methodology was used in which the potency of these PAHs relative to benzo(a)pyrene was used to convert their concentrations to equivalent concentrations of benzo(a)pyrene. These equivalent concentrations were then used in conjunction with the benzo(a)pyrene SFs to calculate risks. This may over- or underestimate risk for these PAHs; however, it is conservative because these PAHs would not otherwise be quantitatively evaluated in the BHHRA.

Toxicity information was not available for dermal exposure; hence, several assumptions for adjustment of the exposure estimate from an administered to an absorbed dose (based on the GI absorption rates of the COPCs) were made in order to calculate dermal adjusted SFs and RfDs, which may overestimate or underestimate risk.

Risk Characterization

Uncertainties in the toxicity assessment are compounded under the assumption of dose additivity for multiple substance exposure. This assumption ignores possible synergisms and antagonisms among chemicals. The assumption that all of the carcinogenic effects are additive could result in the underestimation or overestimation of risk because concurrent exposure to several contaminants might have synergistic or antagonistic toxic effects. However, summing risks for chemicals having various weight-of-evidence classifications and ignoring possible antagonistic effects of some chemicals may overestimate risks. The use of critical effect/target organ HIs to identify COCs instead of summing HQs for all COPCs regardless of critical effect reduces the uncertainty.

The combining of risk across pathways is inherently uncertain because summing risks combines pathways that have different COPCs. Each COPC may have different target organs and/or critical effects, and these target organs and critical effects may differ by route of entry into the receptor. Summing the risk across pathways combines risks as if they were additive when, in actuality, this may not be the case, which may result in an overestimation of potential risk.

Some of the procedures used and uncertainties inherent in the BHHRA process may tend to underestimate potential risk. However, assumptions built into this BHHRA tend to overestimate rather than underestimate potential risks, including conservative assumptions for the exposure scenarios.

2.7.2 Summary of Ecological Risk Assessment

The ERA was intended to develop risk information and assist in the decision-making process for remedial options at the Site. The ERA presented the results of the preliminary screening-level ERA (Steps 1 through 3a), which was conducted to meet the requirements for a preliminary risk evaluation to facilitate the determination of whether a detailed Site-specific risk evaluation (i.e., Steps 3b through 8 of the ERA) was required for the ERA study area. The purpose of the ERA was to evaluate if potential ecological receptors existing on or adjacent to the Site may be exposed to and adversely impacted by chemicals related to former activities or releases originating from the Site.

The data used in the ERA were aggregated into the following nine exposure groups:

- Exposed Surface Soil (0 to 1 feet bgs)
- Exposed and Unexposed Surface Soil (0 to 1 feet bgs)
- Exposed Subsurface Soil (2 to 6 feet bgs)
- Exposed and Unexposed Subsurface Soil (2 to 6 feet bgs)
- Surface Water from the Unnamed Natural Pond Area (including Unnamed Natural Pond, Retention Ponds 1 and 2, and the adjoining wooded wetland area)
- Surface Water from Mill Pond
- Sediment from the Unnamed Natural Pond Area (including Unnamed Natural Pond, Retention Ponds 1 and 2, and the adjoining wooded wetland area)
- Sediment from Mill Pond
- Shallow/Intermediate Groundwater from the Surficial Aquifer

The screening level ERA consisted of the following three steps:

Step 1 – Preliminary Screening-Level Problem Formulation and Ecological Effects Evaluation was performed to help develop the preliminary CSM for the ERA study area and to provide supporting information for Step 2 of the ERA process. This first step of the ERA presented relevant background information, including determination of the environmental setting, evaluation of natural conditions, identification of the Site history, evaluation of chemical bioavailability, and development of a preliminary ecological CSM under current and potential future land use scenarios.

Step 2 – Preliminary Screening-Level Exposure Estimate and Risk Calculation evaluated potential exposures to ecological receptors based upon chemical concentrations in media from the ERA study area and the potentially complete exposure pathways identified in Step 1. In this second step of the ERA, maximum detected concentrations from the analytical data groupings were compared to conservative Ecological Screening Values (ESVs) to determine if there was a potential for risk to ecological receptors associated with the ERA study area.

Based upon the results of Steps 1 and 2, the first Scientific Management Decision Point (SMDP 1) indicated that there were potentially complete exposure pathways for terrestrial and wetland/aquatic receptors that may be exposed to preliminary Chemicals of Potential Ecological Concern (COPECs).

Step 3 – Baseline ERA Problem Formulation established the goals, breadth, and focus of the Baseline ERA using the results of the screening-level Steps 1 and 2 in conjunction with additional supporting information. This third step of the ERA was subdivided into two primary components, Steps 3a and 3b. Step 3a consisted of the initial problem formulation addressing the identification and evaluation of preliminary assessment endpoints and refinement of preliminary COPECs. It was completed in order to refine the preliminary COPECs identified in the initial steps and to determine the final

COPECs for the ERA study area based upon refined conservative and alternative HQs and HIs (for individual chemicals and total chemical classes) using a weight of evidence approach.

Final COPECs were identified only in sediment in the Unnamed Natural Pond exposure group, as shown in Table 5. They include three inorganics (chromium, lead, and zinc), which had alternative HQs of 11.1, 2.29, and 7.79, respectively. These alternative HQs for chromium, lead, and zinc were based on maximum concentrations of 1770, 256, and 2110 mg/kg, respectively, and alternative ESVs of 160, 112, and 271, respectively.

Step 3 identified as the preliminary assessment endpoint the survival and reproduction of all ecological receptors in the study area. The organisms living within each exposure medium in the study area were evaluated as receptors representative of this assessment endpoint. Thus, the refinement of preliminary COPECs was based on the evaluation of risks to fish or aquatic invertebrates living in Site surface waters, benthic invertebrates living in Site sediments, and invertebrates or plants living in Site soils. The COPEC refinement screening of each exposure group resulted in the retention of COPECs only in the sediment of the Unnamed Natural Pond. Four refined COPECs were identified in that sediment as having the potential to pose risk to the benthic invertebrate community of the Unnamed Natural Pond: chromium, lead, zinc, and bis(2-ethylhexyl)phthalate. Ecological risks were not found to be potentially significant for other chemicals in other Site media or exposure groups. The four refined COPECs are not highly bioaccumulative and do not biomagnify, and the water bodies where they occur are small and present limited potential for exposure of higher organisms, such as birds and mammals. Accordingly, additional evaluation of risk to birds and mammals via the food chain was not warranted in Step 3a.

In accordance with EPA Region 4 guidance (EPA, 2000), Step 3a was followed by an SMDP. SMDP 2 indicated that the only assessment endpoint that may warrant further evaluation in the baseline ERA is the abundance and production of the benthic invertebrate community of the Unnamed Natural Pond Area. Ecological risks were not found to be potentially significant for other compounds in Retention Ponds 1 and 2, the wooded wetlands, or within the ERA Study Area.

As a part of the FFS analysis, a Phase I pilot test was performed to provide additional information on the UNP sediments and to provide data to support the Focused Feasibility Study. The objectives of the Phase I pilot test work were to (1) determine if the sediments are toxic to benthic invertebrates, and if so, (2) develop site-specific Sediment Remediation Levels (SRLs).

Sediment toxicity testing using benthic invertebrates was conducted on five sediment samples. The analytical data for the COPECs and other chemical parameters are presented in Table 6. The COPEC analytical data was similar to that observed in the ESI/RI sampling event on October 27, 1999. The results of the toxicity tests indicated that two out of five sediment samples exhibited toxicity characteristics to benthic organisms. Based on the analytical data and the toxicity results, SRLs were proposed and are shown in Table 7.

2.8 Remedial Action Objectives

Remedial Action Objectives (RAOs) are the desired outcome of a cleanup action. The FS and the FFS for the Unnamed Natural Pond identified separate RAOs for on and off site soil and ground water which have been combined into a single concise list. The following RAOs have been selected in order to protect human health and the environment:

- Prevent human exposure to groundwater containing COCs at concentrations that may pose unacceptable risk to human health by restoring groundwater to beneficial use.
- Prevent ingestion and direct contact with soils and sediments containing COCs at concentrations that may pose unacceptable risk to human health and the environment.
- Prevent the discharge of COC-affected groundwater into surface water.
- Restore surface water quality such that any remaining site-related COCs concentrations do not pose unacceptable risk to human health and the environment.

2.8.1 Basis and Rationale for Remedial Action Objectives

Restoration to drinking water standards is a long-term goal for this Site. FDEP Natural Attenuation Default Concentrations (NADCs) will be used to evaluate restoration progress and the potential for passive remedies, such as monitored natural attenuation (MNA). Cleanup goals for soils will be determined in the remedial design once land use restrictions are explored. There is an area of off-site soils that will use direct exposure residential SCTLs as cleanup goals. On-site soils will have a cleanup goal appropriate to the future land use, either direct exposure industrial SCTLs, or direct exposure residential SCTLs. The cleanup goal for Surface Water is USEPA's NRWQC based on consumption of aquatic organisms. Because Mill Pond is not a drinking water supply, the cleanup goal is intended to by protective of human health from consumption of fish from the surface water body.

2.8.2 Risks Addressed by the Remedial Action Objectives

Under the NCP, EPA's goal is to reduce the excess cancer risk to within the range of $1x10^{-4}$ to $1x10^{-6}$ for the expected future land use at the Site. An excess cancer risk of $1x10^{-6}$ is the point of departure for risk management decision making. Similarly, reducing the HI for current and future uses to <1 is also a cleanup goal. Additionally, the NCP sets a goal for EPA to restore ground water resources to their beneficial use to the extent practical within a reasonable timeframe.

2.8.3 Remedial Cleanup Goals

Based on the human health risk-based criteria and analysis of ARARs, the final cleanup goals for contaminated ground water at the ITT-Thompson Industries Superfund Alternative Site are presented on Table 8. As noted above, these cleanup goals were prepared from analysis described in more detail in the HHRA and from ARARs addressed in Section 2.10.2.

2.9 Description of Alternatives

A number of remedial alternatives were evaluated in the Feasibility Study Report (FS) and the Focused Feasibility Study for Sediments in the Unnamed Natural Pond (FFS). For consistency purposes, the numbering/ sequencing of the remedial alternatives are maintained as presented in the FS. Alternatives which were not retained through the screening process are absent from this discussion.

The two alternatives for soil and sediment:

Soil and Sediment Alternative 1	No Further Action
Soil and Sediment Alternative 3	Institutional Controls, Excavation, Off-Site Disposal, and Backfill with Clean Fill

The five alternatives retained for ground water:

GW Alternative 1	No Further Action
GW Alternative 2	Monitored Natural Attenuation
GW Alternative 4A	Groundwater Extraction in Suspected Source Area, Ex-Situ Groundwater Treatment, and Discharge of Treated Groundwater to the POTW
GW Alternative 4B	Groundwater Extraction in Suspected Source Area, Ex-Situ Groundwater Treatment, and Deep Well Reinjection of Treated Groundwater
GW Alternative 6	Offsite and Facility In-situ Enhanced Reductive Dechlorination, with Monitored Natural Attenuation

EPA's Preferred Alternative is the excavation and off-site disposal of soil and sediment contamination and the in-situ bioremediation of groundwater contamination through Enhanced Reductive Dechlorination. These are Soil and Sediment Alternative 3 and Ground Water Alternative 6.

2.9.1 Soil and Sediment Remedial Alternatives

Soil and sediment remedial alternatives from the FS and the FFS are combined because of their similarities. Details of the sediment alternatives are presented in the FFS. Only one soil and one sediment alternative passed the secondary screening. Other alternatives that were considered included natural attenuation, solidification, and in-place disposal for soils, but were eliminated because the technologies would be impractical, ineffective, or would not be economical considering the small scale of the contamination.

2.9.1.1 Soil and Sediment Alternative 1: No Further Action

The no action alternative is used as a basis for comparison with other alternatives and is required by the NCP. No action would be taken to address soil and sediment contamination. The "no action" alternative takes no active measure to ensure protection of human health or the environment. This alternative does not achieve RAOs or ARARs. This alternative provides no long-term effectiveness or permanence for soil or sediment contamination. No reduction in COC mobility is realized. Some reduction of COC toxicity and volume may be achieved via natural attenuation; however, this attenuation would not be monitored or evaluated under this alternative. This alternative provides no short-term effectiveness to reduce risks and poses no implementation-based short-term risks to the community or workers. No costs have been calculated for this alternative. It is assumed that the existing fence will not be maintained.

2.9.1.2 Soil and Sediment Alternative 3: Institutional Controls, Excavation, Off-Site Disposal, and Backfill with Clean Fill

This alternative is the permanent removal of COC-impacted soils and sediments from the Site. Contaminated soils would be excavated and backfilled with clean fill. Contaminated sediments from the Unnamed Natural Pond would be removed by draining the pond, excavating the sediments, and replacing the sediments with clean material appropriate for the re-establishment of the benthic community. Excavated soil and sediment would be transported and disposed of at a licensed and approved disposal facility. ICs such as restricting land use to industrial uses will be implemented as needed. If ICs cannot be put in place, cleanup levels would be adjusted so that ICs are not necessary. Soil sampling will be conducted to verify the lateral and vertical extent of soil and sediment exceeding the cleanup goals and to

obtain disposal approval. The disturbed areas will be re-vegetated. The conceptual layout of Soil and Sediment Alternative 3 is presented on Figure 13.

This alternative provides for overall protection of human health and the environment. Excavation of contaminated soil and sediment eliminates the exposure pathway for material exceeding cleanup goals. RAOs will be achieved by excavating soil and sediment exceeding cleanup goals. Long-term effectiveness and permanence will be verified with a post-excavation confirmatory sampling. This alternative is effective in the short-term. The total project cost is $105,000 comprised of $12,000 capital costs and $93,000 O&M costs. A 20 percent contingency cost is included in the estimation of each of the components of the total project cost.

2.9.2 Ground Water Remedial Alternatives

Common Elements for Ground Water Alternatives

Except for the No-Action alternative, all groundwater alternatives share several common elements. Institutional Controls (ICs) are already in place to restrict the installation of drinking water wells in the area of the groundwater contamination. Long-Term Monitoring is used to evaluate the effectiveness of the remedy. A Light Non-Aqueous Phase Liquid (LNAPL) was discovered in one monitoring well during the pilot test. Because of the limited area impacted, the LNAPL will be collected from that well using an absorbent material and disposed of off-site. Until cleanup levels are reached, vapor intrusion is a possible route of exposure for future users of the Site. As future use is proposed, vapor intrusion will be evaluated on a case-by-case basis. Once cleanup levels are reached, no further potential for vapor intrusion will exist.

2.9.2.1 GW Alternative 1: No Further Action

The no action alternative is used as a basis for comparison with other alternatives and is required by the NCP. No action would be taken to address ground water contamination to ensure protection of human health or the environment. This alternative does not achieve RAOs or ARARs. The potential for exposure of receptors to groundwater is minimized by the ICs in place requiring new construction to connect to the public water supply. This alternative provides no long-term effectiveness or permanence for soil or sediment contamination. No reduction in COC mobility is realized. Some reduction of COC toxicity and volume may be achieved via natural attenuation; however, this attenuation would not be monitored or evaluated under this alternative. This alternative provides no short-term effectiveness to reduce risks and poses no implementation-based short-term risks to the community or workers. No costs have been calculated for this alternative.

2.9.2.2 GW Alternative 2: ICs, MNA and Long-Term Monitoring of Groundwater, LNAPL Collection with Off-Site Disposal, and Vapor Intrusion Evaluation

Monitored Natural Attenuation (MNA) relies on natural attenuation processes already occurring in the plume to reduce contaminant levels below the cleanup goals. The time required for natural processes to achieve cleanup goals is unacceptable. This remedy would consist of leaving the current ICs for ground water in place. Monitoring for natural attenuation involves identifying the appropriate wells to be included in the monitoring plan, identifying the parameters for measurement, the COCs for analysis, and the sampling frequency. Operation of the remedy would include evaluating data and generating an annual report and evaluating the status of progress toward the RAOs.

This alternative does not provide for overall protection of human health and the environment in an acceptable timeframe. ICs do provide for protection of human health through the County and City ordinances. It is unlikely that RAOs and ARARs would be met throughout the plume in an acceptable timeframe. Long-term effectiveness and permanence would not be met in an acceptable period of time. This alternative is not effective in the short-term, due to the long amount of time required for cleanup goals to be reached. The total project cost is $1,510,000, comprised of the capital cost of $12,000, and long-term O&M costs of $1,498,000. A 20 percent contingency cost is included in the estimation of each of the components of the total project cost.

2.9.2.3 GW Alternative 4A and 4B: ICs, Suspected Source Only Groundwater Extraction, Treatment by Air Stripping and GAC, Discharge to Either POTW (4A) or Facility Deep Wells (4B), MNA and Long-Term Monitoring of Groundwater, LNAPL Collection with Off-Site Disposal, and Vapor Intrusion Evaluation

Alternative 4A and 4B are both discussed in this section. This alternative is a "pump and treat" groundwater remediation scheme commonly applied to groundwater contamination sites. The general strategy for this alternative consists of extracting (pumping) contaminated groundwater and treating the extracted contaminated groundwater above ground by air stripping. In Alternative 4A, the treated water would be discharged to a publicly owned treatment works (POTW), or wastewater treatment plant. In alternative 4B the treated water would be re-injected into the aquifer onsite using deep injection well(s). The extraction system will remove suspected source area groundwater only, addressing the rest of the plume through MNA.

This alternative includes the design and construction of a groundwater extraction system, groundwater treatment system, and treated water discharge. The discharge would flow to either a POTW discharge (4A) or Deep Well Injection (4B). O&M of the groundwater treatment system would continue until cleanup goals are met. Also, a long-term MNA monitoring plan would be developed. The current ICs for ground water would be left in place as needed.

This alternative provides for overall protection of human health and the environment through the treatment of extracted suspected source area groundwater. Residuals such as air stripper off-gas will be managed appropriately to protect human health and the environment. RAOs and ARARs would be met throughout most of the plume in an acceptable timeframe; however it is not clear if groundwater extraction would be sufficient to remediate the cover-collapse feature due to its hydrogeologic properties. GW Alternates 4A and 4B provide long-term effectiveness and permanence for most of the plume area. The time until RAOs are achieved in GW Alternative 4 with suspected source area (only) extraction is estimated at 25 years; perhaps longer for the cover-collapse feature groundwater.

Short-term risks to the community and to workers are related to the construction of the groundwater extraction system. Vapor-phase treatment using GAC will appropriately manage the air stripper off-gas such that there are no risks to the community or on-Site workers. Environmental impacts and worker/community health and safety issues include potential discharge of fugitive dust containing COCs, storm water run-off, decontamination procedures, and heavy equipment traffic. Engineering controls will be implemented during these activities to prevent exposures.

The total project cost for Alternative 4A is $7,512,000 comprised of the capital cost of $690,000, and

long-term O&M costs of $6,822,000.

The total project cost for Alternative 4B is $6,722,000 comprised of the capital cost of $1,054,000, and long-term O&M costs of $5,668,000. A 20 percent contingency cost is included in the estimation of each of the components of the total project cost.

2.9.2.4 GW Alternative 6: ICs, Facility and Off-Site Groundwater ERD, MNA and Long-Term Monitoring of Groundwater, LNAPL Collection with Off-Site Disposal, and Vapor Intrusion Evaluation

This alternative is an in-place anaerobic bioremediation approach using ERD, the same technology used in the Pilot Test. Carbohydrates are injected into the aquifer to provide food for microbes which will consume the contaminants in the process of using the carbohydrates as an energy source. This approach uses the injection wells from the pilot test and will involve the installation of additional injection lines as determined in the remedial design. Injections will occur in the LS and/or UF aquifers as determined in the remedial design. The aquifer will be monitored until Natural Attenuation Default Criteria are reached, then natural attenuation would be used. The most important element in the success of the ERD technology is the delivery and distribution of the carbohydrate to the target areas. The conceptual layout of the alternative is shown on Figure 14.

Implementation of this alternative will involve the design and construction of the ERD system. The aquifer(s) to receive ERD injection; the number of wells and their location, alignment, and depths would be determined during remedial design. ERD injections would be carried out and monitored for progress and additional injections or injection solutions may be evaluated. The current ICs for ground water would be left in place as needed. Operation & Maintenance would include periodic injections of carbohydrates and monitoring for proper conditions in the aquifer.

GW Alternative 6 provides for overall protection of human health and the environment. ERD, coupled with MNA, provides for treatment of both the suspected source area and the more dilute plume. ERD injections provide an accelerated approach to remediation while at the same time providing protection for human health and the environment.

This alternative achieves RAOs and complies with ARARs. Compliance is accomplished by in-situ dechlorination of CVOCs. Benzene will be addressed once the aquifer returns to aerobic conditions after ERD is complete. In aerobic conditions, the ring compound (benzene) will be readily degraded. Compliance will be determined through the implementation of a long-term monitoring program to quantitatively measure attenuation and compliance with ARARs. Due to differing hydrogeologic characteristics, the cover-collapse feature may take longer to achieve RAOs than the other aquifer zones or may require combinations of extraction and injection wells to ensure better contact with injection solutions that are determined to be effective in the cover-collapse feature.

Short-term risks to the community and to workers involve the construction necessary to install the ERD injection system. These risks include well drilling, heavy equipment traffic to transport system components and carbohydrate to the Site. Environmental impacts and worker/community health and safety issues include the potential discharge of fugitive dust containing COCs during ERD system installation, storm water run-off, and decontamination procedures. Engineering controls will be implemented during these activities to prevent exposures. The construction time for Alternative GW 6 is approximate 6 months. The time until RAOs are achieved in GW Alternative 6 with suspected source

area and off-Site area ERD is estimated at 14 years; perhaps longer for the cover-collapse feature groundwater.

The total project cost is $2,252,000 comprised of the capital cost of $478,000, short-term O&M costs of $828,000, and long-term O&M costs of $946,000. A 20 percent contingency cost is included in the estimation of each of the components of the total project cost.

2.10 Comparative Analysis of Alternatives

The remedial alternatives have been examined with respect to the evaluation requirements in the NCP, CERCLA, and the factors described in *Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA* (EPA, 1988). The nine evaluation criteria are:

Threshold Criteria

Overall protection of human health and the environment; and,
Compliance with ARARs.

Balancing Criteria

Short-term effectiveness;
Long-term effectiveness and permanence;
Reduction of mobility, toxicity, or volume through treatment;
Implementability; and,
Cost.

Modifying Criteria

State acceptance; and
Community acceptance.

The comparative analysis compares and contrasts alternatives one to the other with respect to the detailed analysis evaluation criterion. The comparative analysis focuses on the key differences between the alternatives and attempts to highlight critical issues of concern. The primary objectives for the preferred remedial action are satisfying the threshold criteria: to protect human health and the environment and to comply with ARARs. For an alternative to be considered for selection, these two threshold criteria must be met. Both "No Further Action" Alternatives, Soil and Sediment Alternative 1 and Ground Water Alternative 1, is removed from further analysis because it does not meet the two threshold criteria; however, it is included in the summary table for comparison.

Tables 9 and 10 present a summary of the comparative analyses of the Soil and Sediment and Ground Water Alternatives, respectively, along with the ranking scores for each evaluation criterion. The performance of each alternative against the criteria (except for present worth cost) was ranked on a scale from 0 to 5. A score of 0 indicates that none of the criterion's requirements were met, while a score of 5 is indicates that all of the requirements for that criterion were met. These scores are simple ratings to translate the results of the relative comparison among alternatives; they are not cumulative. For a full comparison, both the comparative analysis score and the present worth costs must both be considered.

2.10.1 Soil and Sediment Alternative Comparative Analysis

Overall Protection of Human Health and the Environment

This evaluation criterion is used to assess whether an alternative provides for adequate protection of human health and the environment. The assessment of protection draws on the analyses conducted under other evaluation criteria, with emphasis on short-term effectiveness, long-term effectiveness and permanence, and compliance with ARARs. The evaluation of the overall protectiveness of an alternative focuses on whether that alternative achieves adequate protection in a reasonable time and describes how Site risks posed through each exposure pathway are eliminated or reduced by either treatment, engineering controls, or institutional controls associated with the alternative. Overall, protection from media that exceeds cleanup goals is based largely on the certainty that the remedy can achieve and maintain clean-up levels or eliminate potential exposure pathways. This criterion must be satisfied for an alternative to be considered as the selected remedy.

The future hypothetical soil exposure pathways to humans are dermal contact, incidental ingestion, and inhalation. One exposure pathway to the population and the environment is potential fugitive dust during remedial alternative implementation.

Soil and Sediment Alternative 3 will meet the Site RAOs for soils by eliminating potential direct contact and protect groundwater by removal or treatment of the soil. Soil and Sediment Alternative 3 would provide the highest level of overall protection through excavation of soils exceeding cleanup goals with off-site disposal. Soil and Sediment Alternative 3 would reduce the risks associated with potential exposure expeditiously.

Compliance with ARARs

This evaluation criterion is used to determine whether an alternative meets federal and state ARARs. This criterion must be satisfied for an alternative to be considered in the selection process. Applicable requirements are those clean-up standards, standards of control, and substantive environmental protection requirements promulgated under federal or state law that specifically address the Site. Relevant and appropriate requirements are those federal and state regulatory requirements that, while not "applicable", address problems or situations sufficiently similar to those encountered at the Site and are appropriate to the circumstances of release or threatened release. Section 2.13.2 presents location-, chemical-, and action-specific ARARs that apply to the Site.

Cleanup goals are numerical values that represent chemical-specific ARARs. Alternative 3 would meet soil cleanup goals (determined to be either residential or industrial in the remedial design) in these areas upon completion of removal and satisfactory completion of confirmatory sampling. Alternative 3 would comply with chemical-specific ARARs and TBCs concerning worker and public safety by providing worker protection and emission control during construction and operation.

Long-Term Effectiveness and Permanence

This criterion addresses the long-term effectiveness and permanence the alternatives afford, along with the degree of certainty that an alternative will prove successful. Factors to be considered include: 1) the effectiveness of an alternative in terms of residual risk remaining at the Site after response objectives have been completed and 2) the reliability and maintenance of controls that are used to manage the risk

posed by treatment residuals and untreated media. The evaluation assesses residual constituents that may remain in the soil after the remedial action has been completed. The effectiveness of the alternative is evaluated in terms of the risk posed by the soil and groundwater quality after implementation/operation. Further, any residual constituents remaining in soil or groundwater generated by the alternative may be evaluated.

Magnitude of Residual Risks
Soil and Sediment Alternative 3 provides a high level of long-term effectiveness and permanence by providing more definitive removal of contaminated soil and sediment. This alternative requires post-excavation confirmatory sampling to determine adequacy of excavation. There is no long-term management or five-year reviews necessary for Soil and Sediment Alternative 3.

Adequacy and Reliability of Controls
Soil and Sediment Alternative 3 is adequate and reliable in preventing exposure to contaminated soil and sediment.

Reduction of Mobility, Toxicity, or Volume through Treatment
This criterion addresses the degree to which alternatives permanently and significantly reduce mobility, toxicity, or volume of COCs in media exceeding cleanup goals. This criterion considers: 1) the treatment process used; 2) the amount of impacted media treated; 3) the degree of expected reduction in mobility, toxicity, or volume; 4) the degree to which treatment is permanent; and 5) the type and quantity of residuals remaining after treatment, both in the soil matrix and from any treatment process.

Soil and Sediment Alternative 3 is appropriate for the volume of soil and sediment requiring remediation. Soil and Sediment Alternative 3 reduces the mobility, toxicity, and volume of COCs within contaminated soil and sediment through the permanent removal and off-Site disposal of material exceeding clean up goals.

Short-Term Effectiveness
This criterion addresses the effects of each alternative during the implementation and construction phases until clean-up levels are achieved. Alternatives are evaluated under this criterion based on their effects on human health, welfare, and the environment during initial phases of the remedial project. The evaluation considers 1) the protection of the community during remedial actions, 2) the protection of workers during remedial actions, 3) the environmental impacts of construction and operation, and 4) the time until remedial response objectives are achieved.

Implementation of Soil and Sediment Alternative 3 requires construction operations and sampling. Use of trained personnel and personal protective equipment (PPE) is necessary for Soil and Sediment Alternative 3 because excavation and handling of soils exceeding clean up goals are involved. Therefore, some risks would be incurred during remedial actions and PPE and air monitoring would be required. However, equal protection to the workers and community would be achieved through the use of PPE and construction techniques such as dust suppression.

Soil and Sediment Alternative 3 has an estimated implementation time of approximately 2 months. This alternative creates short-term risks of community and worker exposure and the potential of fugitive dust during excavation, transportation, treatment, off-Site disposal, and grading. Excavation risks appear manageable by using appropriate engineering and construction management controls. The environmental impacts (e.g., fugitive dust, runoff) are expected to be minimal during implementation of all alternatives

via the appropriate engineering controls.

Implementability
This criterion addresses whether or not there are technical problems or administrative issues associated with an alternative that would halt or delay the remediation. This includes analyzing the availability of various services and materials required during its implementation. This criterion considers 1) the ability to construct and operate the technology; 2) the reliability of the technology; 3) the ease of undertaking future remedial actions; 4) the duration of monitoring required; 5) the coordination with other agencies; 6) the availability of treatment, storage capacity, and disposal services; and 7) the availability of necessary equipment, specialists, and materials.

Soil and Sediment Alternative 3 involves the excavation of soil and sediment exceeding clean up goals and involves an estimated transport of approximately 420 tons of soil and 1,300 tons of sediment. This would cause some disruption to the rural community. Future remedial actions, such as additional excavation if confirmation sampling necessitates removal of additional soil, are easily implementable for Soil and Sediment Alternative 3. Implementation of Soil and Sediment Alternative 3 would require access agreements from the property owners.

Cost
This criterion addresses the cost for Soil and Sediment Alternative 3. Costs evaluated include capital, O&M, and present worth. The estimated cost of Soil and Sediment Alternative 3 is $355,000.

2.10.2 Groundwater Alternative Comparative Analysis

Overall Protection of Human Health and the Environment

Future hypothetical pathways to human health and the environment relative to groundwater and LNAPL include dermal contact and incidental ingestion. Groundwater use restrictions and alternate water supply apply to all the GW alternatives. Therefore, adequate protection is afforded during the remedial period for each of the four retained GW Alternatives (No Further Action has been removed from further analysis.)

Of the four GW Alternatives, GW Alternative 2 (MNA) is the least protective, as clean up levels are reached in the long time period. GW Alternatives 4A and 4B (extraction and treatment) and GW Alternative 6 (ERD) are more protective. The estimated length of remediation for GW Alternative 2 is more than 30 years and for GW Alternative 4A and 4B is approximately 25 years. GW Alternative 6 provides an accelerated approach to remediation, estimated at 14 years; and therefore provides accelerated protection because off-Site areas are addressed.

Compliance with ARARs

This evaluation criterion is used to determine whether an alternative meets federal and state ARARs. This criterion must be satisfied for an alternative to be considered in the selection process. Applicable requirements are those clean-up standards, standards of control, and substantive environmental protection requirements promulgated under federal or state law that specifically address the Site. Relevant and appropriate requirements are those federal and state regulatory requirements that, while not "applicable", address problems or situations sufficiently similar to those encountered at the Site and are appropriate to the circumstances of release or threatened release. Section 2.13.2 presents location-, chemical-, and

action-specific ARARs that apply to the Site.

Clean up goals are numerical values that represent chemical-specific ARARS. The active GW Alternatives (4A, 4B, and 6) would more easily meet groundwater clean up goals. The cover-collapse feature with its differing hydrogeologic conditions makes it more challenging for MNA to achieve cleanup goals. Alternatives 4A and 4B would comply with chemical-specific ARARs and TBCs concerning worker and public safety by providing worker protection and emission control of off-gas during operation of the air stripper.

LNAPL disposal would require compliance with action-specific ARARs regarding RCRA Subtitle D regulations for off-Site disposal. This would apply to all GW alternatives; therefore it is not a deciding factor in the comparative analysis.

Long-Term Effectiveness and Permanence
This criterion addresses the long-term effectiveness and permanence the alternatives afford, along with the degree of certainty that an alternative will prove successful. Factors to be considered include: 1) the effectiveness of an alternative in terms of residual risk remaining at the Site after response objectives have been completed and 2) the reliability and maintenance of controls that are used to manage the risk posed by treatment residuals and untreated media. The evaluation assesses residual constituents that may remain in the groundwater after the remedial action has been completed.

The certainty that the alternative will prove successful is high for the treatment alternatives (4A, 4B, and 6) as they are proven technologies applied to the Site COCs. GW Alternative 2 may have trouble achieving cleanup levels in the cover-collapse feature, although for most of the plume, ESI/RI and current data support declining concentrations and the viability of the MNA option. GW Alternatives 4A and 4B have been proven effective for sites with similar COCs. GW Alternative 6 has Site-specific pilot test information (the 18-month ERD Pilot Test and post-Pilot Test activities) that demonstrate effectiveness of the alternative.

Magnitude of Residual Risks
All active treatment GW Alternatives (4A, 4B, and 6) provide for treatment to clean up goals; therefore, no residuals are expected to be left in place at the time of closure. Residuals that occur during the remediation period include potentially COC laden off-gas from the air stripper (GW Alternatives 4A and 4B) and methane or vinyl chloride dissolved gas produced as a result of the desired ERD reactions (GW Alternative 6). GW Alternatives 4A and 4B would provide for off-gas treatment using GAC to appropriately manage the air stripper off-gas residual. Spent GAC from GW Alternatives 4A and 4B would be sent off-Site for appropriate disposal. The methane and vinyl chloride produced in GW Alternative 6 is anticipated to be localized around the injection well network and will degrade naturally. Dissolved gas management will be part of the ERD remedial design, if selected. GW Alternative 2 may leave residual contamination in the cover-collapse feature for an unacceptable length of time.

LNAPL removal will be successful depending on the recharge rate and the volume present. Currently, the volume of residual LNAPL is low; engineering judgment would lean toward a successful approach to LNAPL removal via the present in-well adsorbent sock. Implementation could easily be combined with site visits needed to implement elements of the selected remedial alternative.

Adequacy and Reliability of Controls
GW Alternatives 4A, 4B, and 6 are adequate and reliable in controlling exposure to residuals that may be

created from treatment processes at the Site during remediation. Existing groundwater ordinances, waivers, and connection to public water supply provide protection during the period of remediation for all of the alternatives.

Reduction of Mobility, Toxicity, or Volume through Treatment
This criterion addresses the degree to which alternatives permanently and significantly reduce mobility, toxicity, or volume of COCs in media exceeding clean up goals. This criterion considers: 1) the treatment process used; 2) the amount of impacted media treated; 3) the degree of expected reduction in mobility, toxicity, or volume; 4) the degree to which treatment is permanent; and 5) the type and quantity of residuals remaining after treatment, both in the groundwater matrix and from any treatment process.

All the alternatives are effective in the reduction of mobility, toxicity, and volume through treatment. The greatest difference in how this is accomplished relates to the time to remedy completion. As a result Alternative 6 achieves a reduction in the mobility, toxicity, and volume of contaminants the most quickly, followed by Alternative 4A and 4B (equally effective), and lastly Alternative 2.

Residuals produced by in-situ treatment would not be expected to increase toxicity or volume for sustained periods. As indicated, the dechlorination process is a known progression with a known and measurable outcome. It is possible to monitor the degradation process. Current protection is in place with respect to groundwater consumption and a methane monitoring program developed as part of RD efforts would provide suitable protection during periods of methanogenesis.

Short-Term Effectiveness
This criterion addresses the effects of each alternative during the implementation and construction phases until RAOs are achieved (e.g., clean-up levels are achieved). Alternatives are evaluated under this criterion based on their effects on human health, welfare, and the environment during initial phases of the remedial project. The evaluation considers 1) the protection of the community during remedial actions, 2) the protection of workers during remedial actions, 3) the environmental impacts of construction and operation, and 4) the time until remedial response objectives are achieved.

All groundwater alternatives contain an approach to potential vapor intrusion. Until such time as clean-up levels are achieved in soil, soil vapor, and groundwater on-Site and the groundwater RAOs are achieved off-Site, this approach will provide a method of evaluation and action (if necessary) to address potential vapor intrusion from the soil, soil vapor, and/or groundwater.

GW Alternative 6 may produce dissolved gasses such as methane or vinyl chloride during the course of the dechlorination process. The occurrence of these compounds is expected as part of the dechlorination process and is transient. As stated in earlier sections, a management program would be developed during RD to address the potential for these compounds.

Implementation of GW Alternatives 4A, 4B, and 6 would require construction and operation of remedial systems. Additionally, sampling personnel would be involved in all four GW alternatives. Sampling personnel would use PPE because sampling of groundwater and collection of LNAPL would be required. This would affect all GW alternatives equally. The construction of GW Alternatives 4A, 4B, and 6 would entail construction that may liberate fugitive dust to the air and stormwater run-off. For both GW Alternatives 4A and 4B, groundwater would be brought to the surface for treatment, providing a potential route of exposure.

The implementation time ranges from immediate implementation (for GW Alternative 2) to 6 months (for GW Alternative 6), pending approval from USEPA and the ability to obtain required access agreements. Implementation time for GW Alternatives 4A and 4B are one year at a minimum and perhaps longer if permitting processes are lengthy. The permitting process has the capacity to delay implementation of Alternatives 4A or 4B and due to the required content of the permit applications, must take place following the design period rather than concurrent with it.

The short-term effects to the community are anticipated to be low for GW Alternatives 2 and 6 and low to moderate for GW Alternatives 4A and 4B. Short-term effects to workers are expected to be low for in-situ GW Alternatives 2 and 6 and moderate for GW Alternatives 4A and 4B due to the potential for contact with groundwater exceeding clean up goals. Short-term risks for workers involved in LNAPL collection and management may be slightly higher; however, these personnel will be trained in hazardous waste management which will serve to mitigate the short-term risk.

Implementability
This criterion addresses whether or not there are technical problems or administrative issues associated with an alternative that would halt or delay the remediation. This includes analyzing the availability of various services and materials required during its implementation. This criterion considers 1) the ability to construct and operate the technology; 2) the reliability of the technology; 3) the ease of undertaking future remedial actions; 4) the duration of monitoring required; 5) the coordination with other agencies; 6) the availability of treatment, storage capacity, and disposal services; and 7) the availability of necessary equipment, specialists, and materials.

All four of the GW Alternatives are implementable at the Site. The equipment and services are proven, reliable, and readily obtainable. There are no on-Facility or off-Site impediments to constructing any of the elements of the four alternatives; however, property owner agreement and access will be needed for any of the alternatives. Monitoring activities are currently on-going, therefore it is expected that this element will not prove difficult to implement. GW Alternative 4A may require particular monitoring to ascertain that treated groundwater quality is acceptable to discharge to the POTW; but this type of technology is readily available. A similar situation may exist for the deep well reinjection discharge, and likewise, appropriate testing technology is readily available.

Implementability of one discharge option versus the other may depend on regulatory / state acceptance with respect to the SJWMD. According to the Madison County POTW, adequate capacity exists to accept the planned discharge from the Site should GW Alternative 4A be selected. Carbohydrate needed in GW Alternative 6 is readily available from vendors.

Cost
This criterion addresses the cost for each alternative. Costs evaluated include capital, O&M, and present worth. The estimated total project present worth values reflect a common degree of complexity and/or remedial time between the alternatives. GW Alternative 2 provides the lowest overall cost ($1,510,000), but also the longest estimated project life of 30 years. GW Alternative 6 provides the next highest cost ($2,252,000) and the shortest estimated project life of approximately 14 years. GW Alternatives 4B and 4A have the next highest costs ($6,722,000 and $7,512,000, respectively) and have an estimated project life of approximately 25 years.

2.11 Principal Threat Wastes

The NCP establishes an expectation that EPA will address the principal threats posed by a site through treatment wherever practicable (NCP §300.430(a)(1)(iii)(A)). Identifying principal threat waste combines concepts of both hazard and risk. In general, principal threat wastes are those source materials considered to be highly toxic or highly mobile, which generally cannot be contained in a reliable manner or would present a significant risk to human health or the environment should exposure occur. None of the material on site is considered to be "principal threat waste".

2.12 Selected Remedy

The remedy selected for ITT Thompson Industries is a combination of Soil and Sediment Alternative 3 and Ground Water Alternative 6. This remedy will address contaminated soil and sediments by completely removing the contaminated material from the site and disposing it in a proper disposal facility. Ground water contamination will be eliminated using enhanced bioremediation, which will also cease any impacts to surface water in Mill Pond. This remedial action addresses releases that occurred at the former ITT Thompson Industries facility in Madison, Florida.

Soil and Sediment Alternative 3 (S-3), consists of the excavation, transportation, and offsite disposal of soils and sediments containing COCs at concentrations that exceed the cleanup goals. Under this alternative, the potential for direct contact and ingestion of contaminated soil or sediment, and the potential for contaminant migration to groundwater will be eliminated. Contaminated sediments from the UNP will be excavated to the underlying clay. Subsequent to the excavation activities, the pond and all excavated areas will be backfilled with clean fill material. Surrounding areas will be restored to pre-construction conditions.

Groundwater Alternative 6 (GW-6) uses in-situ treatment of COCs to achieve cleanup goals. Enhanced Reductive Dechlorination will be followed by Monitored Natural Attenuation of contaminants until cleanup goals are met. The ERD Pilot Test has been successful in dramatically reducing contaminant concentrations at the Site. Carbohydrate injections will be carried out in additional areas to address more of the contamination. Figure 14 shows a conceptual layout of the injection lines in the LS and UF aquifers. Institutional controls restricting the installation of drinking water wells prevent potential exposure to contaminants during the remedial activities. Any reuse at the site will trigger a vapor intrusion evaluation to be sure that human health is protected until the cleanup levels are reached. Light The Non-Aqueous Phase Liquid (LNAPL) that was discovered in one monitoring well during the pilot test will be collected using an absorbent material and disposed of off-site.

2.12.1 Rationale for the Selected Remedy

The selected remedy will eliminate the risk posed by contaminated soil and sediment by removing contamination from the Site permanently. Other remedial approaches were considered, but because the amount of soil and sediment is relatively small, removal and disposal was the most economical, effective, and permanent approach.

Ground water contamination from the Site has decreased significantly by natural processes over the years and natural attenuation processes have been documented. Because of the hydrology and geochemistry of the contaminated aquifers, an enhanced bioremediation approach was suggested and explored by the Enhanced Reductive Dechlorination pilot test starting in 2004 and continuing to the present. The results of the pilot test clearly indicate that the enhanced bioremediation approach is working well at this site.

Compared to the other remedial approaches considered, the selected remedy is faster, more effective at eliminating contamination, and more cost effective.

Surface water contamination from the Site was found in only one sample in Mill Pond. The source of the contamination in surface water is contaminated ground water discharging into Mill Pond. By eliminating the ground water contamination, the impact to surface water will be eliminated.

The modifying criteria of state and community acceptance have been incorporated into the selected remedy. The State of Florida, as represented by the FDEP, has been the support agency during the RI/FS process for the Site. In accordance with 40 CFR §300.430, as the support agency, FDEP has provided input during the process. The community has participated in the review of the Proposed Plan, and, based on the comments received, supports the selected remedy.

2.12.2 Description of the Selected Remedy

The selected remedy for contaminated soil and sediment is excavation and proper off-site disposal. Contaminated soils would be excavated and backfill with clean fill. Contaminated sediments from the Unnamed Natural Pond would be removed by draining the pond, excavating the contaminated sediments, and replacing the sediments with clean material appropriate for the re-establishment of the benthic community. Excavated soil and sediments would be transported and disposed of at a licensed and approved disposal facility. ICs such as restricting land use to industrial uses will be implemented as needed. If ICs cannot be put in place, cleanup levels would be adjusted so that ICs are not necessary. The conceptual layout of Soil and Sediment Alternative 3 is presented in Figure 13.

Implementation of this alternative will involve the following activities:

- Soil sampling to verify the lateral and vertical extent of soils exceeding the cleanup goals and to obtain disposal approval from a Subtitle D landfill;
- Definition of the most efficient haul route to the landfill;
- Coordination of soil excavation with sediment removal from the UNP;
- Clearing trees and over-grown brush near and around the excavation areas;
- Establishing the boundaries of excavation with a survey;
- Defining the work area with temporary fencing or other barriers to prevent inadvertent access by the public;
- Excavation of the soils and sediments and placement in lined and tarped haul trucks;
- Transportation and disposal at an approved Subtitle D landfill;
- Confirmation sampling;
- Backfilling of the excavation with clean fill material; and
- Re-vegetation of the disturbed areas.

The selected remedy for ground water is in-place anaerobic bioremediation approach using ERD, the same technology used in the Pilot Test. Carbohydrates are injected into the aquifer to provide food for microbes which consume the contaminants in the process of using the carbohydrates as an energy source. This approach uses the injection area from the pilot test and will involve the installation of additional injection lines in the LS and/or the UF aquifers as determined in the remedial design. Injections and conditions in the aquifer will be monitored until the level of contamination decreases to the point that natural attenuation will reach the cleanup goals.

The conceptual layout of the alternative is shown on Figure 14. Implementation of this alternative

will involve the following activities:

- Continuation of public supply for existing wells and continuation of the City of Madison and County of Madison Ordinances;
- Construction of the ERD system according to the RD drawings and specifications, the specific aquifer(s) to receive ERD injection; well number, location, alignment, and depths would be determined during remedial design;
- ERD injections according to the remedial design;
- Generation of ERD Construction Report;
- Periodic evaluation of the ERD (frequency as identified in the design) with generation of Annual ERD Evaluation Reports;
- Identification of the appropriate wells to be included in the long-term monitoring plan;
- Identification of the parameters for measurement and COCs for analysis and the sampling frequency;
- Continued implementation and updates, as necessary, of the project QAPP and HASP;
- On-going evaluation of data and generation of annual summary report to USEPA;
- Collection of LNAPL via an in-well sorbent sock with proper off-Site disposal at a fully licensed TSDF;
- Evaluation of RAO status and modifications to ICs, as necessary; and
- The approach to VI described in Section 4.5.2 is also part of this remedy. Management of dissolved gases associated with ERD (methane and vinyl chloride) will be addressed in the remedial design.

The remedy selected for ground water will also eliminate the impacts to surface water in Mill Pond.

2.12.3 Operation & Maintenance

Operation and maintenance (O&M) requirements for maintaining the selected remedy to ensure long term protectiveness will be developed during remedial design. A final O&M Plan will be developed as part of the post-construction report. The basic O&M requirements are periodic repair and maintenance of injection and monitoring wells.

2.12.4 Institutional Controls

ICs are already in place to prevent residential use of ground water as drinking water. Once the remedial action is complete, ICs for ground water use will no longer be needed.

The clean up for contaminated soil may require ICs such as restricting land use to industrial uses. This determination will be made during remedial design, but the remedy selected will remain excavation and proper off-site disposal. If ICs cannot be put in place, cleanup levels would be adjusted so that ICs are not necessary. If ICs are needed, one would be a restrictive covenant to limit the use of the former facility property to commercial/industrial uses. The restrictive covenant will ensure that the land use remains non-residential and that appropriate precautions are taken for any potential future activities. EPA would coordinate establishment of the covenant with FDEP, if needed. The covenant will be drafted in accordance with FDEP's Institutional Controls Procedures Guidance (FDEP, 2004) using the model Declaration of Restrictive Covenant.

2.12.5 Summary of Estimated Remedy Costs

The cost estimate for Soil and Sediment Alternative 3 is $355,000. A 20 percent contingency cost is included for each component of the total project cost. Because the excavation would occur in one year, the cost in not adjusted to present worth.

The total project cost for Ground Water Alternative 6 is $2,252,000, comprised of the capital cost of $478,000, short-term O&M costs of $828,000, and long-term O&M costs of $946,000. A 20 percent contingency cost is included in the estimation of each of the components of the total project cost. This is an order of magnitude cost estimate that is expected to be within a margin of plus 50 percent to minus 30 percent of the actual project costs. The estimated present worth is used to evaluate remedial alternatives that occur over several years. The estimated present worth is based on a discounted rate of five percent and an estimate for the time required for long-term maintenance/monitoring. Additional changes in the cost estimate are likely to occur as new information and data are collected during the engineering design of the remedial alternatives. Major changes, if they occur, may be documented in the form of a memorandum in the Administrative Record file, an ESD, or a ROD Amendment.

The cost estimates for the remedy is included as Table 11. The specific assumptions used in the cost estimates, in terms of the number, location, and operation of wells and the volumes of soil and sediments will be refined in the remedial design.

2.12.6 Expected Outcomes of the Selected Remedy

Following the implementation of the selected remedy and the achievement of clean up goals, the Site will no longer pose an unacceptable risk to human health and the environment.

2.12.6.1 Available Land Uses

The soil contamination at the facility from the past manufacturing operations will be addressed and the Site will be suitable for reuse appropriate to the planned future use of the property. The future use will be determined after discussions with the property owners regarding the future use of the site. The sediment contamination in the UNP will be removed and the sediments replaced with a suitable clean material.

2.12.6.2 Available Water Uses

The EPA expects that the remedial action will restore the quality of the ground water in the area so that it could be used without restriction. Contaminated ground water is discharging into Mill Pond and after the ground water reaches cleanup goals, there will be no threat to the quality of surface water in Mill Pond.

2.12.6.3 Final Cleanup Goals

The cleanup goals noted in Table 8 were derived from analysis described in more detail in the BHHRA, the FS, and the FFS for the UNP. The ground water clean up goals meet the current federal regulatory drinking water standards or maximum contaminant levels (MCLs) and current FDEP Ground Water Contaminant Levels (GCTLs). The cleanup goals for soils fall within the EPA's acceptable risk range for Superfund Sites, as documented in the BHHRA. The EPA is using the residential or industrial

(depending on land use) FDEP direct exposure Soil Cleanup Target Levels (SCTLs), which were identified as Relevant and Appropriate ARARs. The surface water clean up level is based on the National Recommended Water Quality Criteria based on human consumption of aquatic organisms. The soil, ground water, and surface water clean up goals are based on the protection of human health and correspond to a site-specific Hazard Quotient (HQ) of less than 1 and a site-specific cumulative excess lifetime cancer risk more protective than 1×10^{-6}, or one in one million.

The clean up goals for sediment are based on site-specific toxicity testing results, which will be protective of ecological receptors in the pond. Because all of the sediment will be removed and replaced by clean material, none of the existing sediment will remain in the pond.

2.12.6.4 Anticipated Community and Environmental Benefits

The selected remedy will benefit the community by enabling the reuse of the Site property. Also, once ground water clean up goals are met, the ground water will be suitable for use by the community. Environmental benefits are primarily to the biota in the UNP behind the facility. The community is supportive of the remedy.

2.13 Statutory Determinations

Based on information currently available, EPA as the lead agency believes the selected remedy meets the threshold criteria and provides the best balance of benefits with respect to the balancing and modifying criteria. The EPA expects the selected remedy to satisfy the following statutory requirements of CERCLA 121(b): (1) be protective of human health and the environment; (2) comply with ARARs (or justify a waiver); (3) be cost-effective; (4) utilize permanent solutions and alternative treatment technologies or resource recovery technologies, and satisfy the preference for treatment as a principal element to the extent practicable.

2.13.1 Protection of Human Health and the Environment

The selected remedy satisfies the statutory requirement for protection of human health and the environment through removal of contaminated soil and sediment and in-situ ground water treatment with few short-term hazards or adverse impacts and minimal long-term residual risks. The engineering principles and technology for the selected remedy are well-established, and are expected to be reliable over the long-term. The remedy is compatible with the expected future use of the Site.

2.13.2 Compliance with ARARs

Implementation of the selected remedy will comply with all federal and state chemical-specific, action-specific, and location-specific ARARs.

Chemical-specific requirements include those laws and regulations governing the release of materials possessing certain chemical or physical characteristics, or containing specified chemical compounds. Chemical-specific requirements set health or risk based concentration limits or ranges in various environmental media for specific hazardous substances, contaminants, and pollutants. State requirements to attain risk-based cleanup goals for carcinogens of 1×10^{-6} and a hazard index of 1 or less for non-carcinogens will be met by the selected remedy. Table 12 presents the chemical-specific ARARs, to-be-considered (TBCs) guidance, and criteria for the Selected Remedy.

Action-specific requirements are technology-based, or establish performance, design, or other similar action-specific controls or regulations for the activities related to the management of hazardous substances or pollutants. Action-specific requirements are triggered by the remedial action selected to accomplish the cleanup. A summary of the requirements to be met through the implementation of the selected remedy is provided in Table 13.

Location-specific requirements are design requirements or activity restrictions based on the geographic or physical position of the site and its surrounding area. Location-specific requirements set restrictions on the types of remedial activities that can be performed based on site-specific characteristics or location. No location-specific requirements were identified as shown in Table 14.

2.13.3 Cost Effectiveness

EPA has determined that the selected remedy is cost-effective and that the overall protectiveness of the remedy is proportional to the overall cost of the remedy. The cost-effectiveness of the remedy was assessed by comparing the overall effectiveness of the remedy (i.e., long-term effectiveness and permanence; reduction in M/T/V; short-term effectiveness) with the other alternatives considered. More than one remedial alternative may be considered cost-effective, but CERCLA does not mandate that the most cost-effective or least expensive remedy be selected. The implementation of the seleted remedy will be paid for by the responsible party, ITT Corporation.

2.13.4 Permanent and Alternative Treatment solutions

The selected remedy uses permanent solutions and alternative treatment technologies to the maximum extent practicable. The selected remedy will provide long-term effectiveness and permanence. The remedy requires institutional controls over the short-term to remain effective, but these controls can be removed when cleanup levels are attained. The remedy can be reliably considered permanent.

2.13.5 Preference for Treatment as a Principal Element

In addition to the four statutory mandates previously discussed, the NCP includes a preference for treatment for the selected remedy in addressing the principal threat at the Site. The selected remedy meets the preference for treatment as a principal element for ground water contamination. The selected remedy is based on active treatment to address the mobility, toxicity, and volume of the contaminated ground water and removal to address the volume of the contaminated soil and sediment.

2.13.6 Five-Year Review Requirement

CERCLA Section 121 and 40 CFR Part 300 require a review of remedial actions at least every five years if the remedial action results in hazardous substances, pollutants, or contaminants remaining in place above levels that allow for unlimited use and unrestricted exposure. Since the selected remedy is based on in situ treatment of ground water that is estimated to take approximately fourteen years to reach clean up goals, a statutory review of the remedial action is required within 5 years of the beginning of remedial construction and every 5 years thereafter until unlimited use and unrestricted exposure levels are achieved. If the soil excavation leaves contaminated soil on the Site above levels that allow for unlimited use and unrestricted exposure, five years reviews will be required to ensure the remedy remains protective. If the soil excavation achieves unlimited use and unrestricted exposure levels, five year

reviews will not be needed for that part of the Site. The clean up level for soil will be determined in remedial design.

2.14 Documentation of Significant Changes

Pursuant to CERCLA 117(b) and NCP 300.430(f)(3)(ii), the ROD must document any significant changes made to the Preferred Alternative discussed in the Proposed Plan. There have been no significant changes to the Preferred Alternative discussed in the Proposed Plan.

2.15 References

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PART 3: RESPONSIVENESS SUMMARY

3.1 Overview and Summary

This Responsiveness Summary documents public comments and EPA responses to comments on the proposed plan for ITT Thompson Superfund Site in Madison, Madison County, Florida. The announcement of the Proposed Plan public meeting and the notice of the availability of the Administrative Record were published in the Local Newspaper on August 27, 2008. The Proposed Plan was mailed on August 15, 2008. The Public Comment Period for the Proposed Plan was from August 18, 2008 through September 18, 2008. The EPA presented the Proposed Plan to the community at a public meeting on August 28, 2008 at the North Florida Community College located in Madison, Florida with 30 people in attendance. Representatives from EPA, and FDEP listened to questions and comments from the community concerning the proposed remedy and the remedial alternatives evaluated. The transcript from the public meeting can be found in the Administrative Record.

The Administrative Record file is available to the public at the Madison Public Library located at 378 N.W. College Loop, Madison, FL 32340 and in the information repository maintained at the EPA Region 4 Superfund Record Center.

3.2 Written Public Comments

Comments from Residents received by email

Comment:

Regarding the proposed use of dilute molasses to combat the volatile organic compounds your team has mapped, I heartily support the plan with one cautionary comment. Please ensure that monitoring is conducted regularly outside as well as within the projected treatment area to ensure against changes due to other unforeseen mechanisms. Rather than just blindly take the most effective course, it is often essential to gauge the progress and direction to enable course corrections as needed.

EPA's Response:

Monitoring is an important part of the selected remedy and will be carried out on a regular basis to track the impacts of treatment. The areas that are impacted by the treatment will be closely followed to be certain that the entire area impacted is included in the monitoring program. The monitoring program will be designed according to EPA and FDEP requirements and must be approved by EPA before the remedy is implemented.

Comment:

On a personal note, I have learned that my son and his family at the time lived on Yellow Pine Road and utilized well water for over two years due to financial burdens of city water cutoff/reconnection fee. Is there any health condition that should be closely monitored for potential adverse impact? I would gratefully appreciate your advice. Also, I would hope to offer my son's cooperation in any study of human health conditions, if you should need willing participants.

EPA's Response:

It is not possible to be sure about exposure that occurred in the past. The levels of contamination have been decreasing at the Site. The RPM will contact the resident to discuss the location of the home further.

The EPA works closely with another federal agency (ATSDR) to address health issues. If you think you are experiencing health problems, contact your doctor. The ATSDR can consult with your doctor if there are health problems that may be related to the site. The contaminants in the groundwater include the chlorinated solvents TCE, DCE and Vinyl Chloride. Information on health effects is available in Toxicological Profile Factsheets from the ATSDR website: http://www.atsdr.cdc.gov

Toxicological Profile for Trichloroethylene (TCE)
http://www.atsdr.cdc.gov/toxprofiles/tp19.html

Toxicological Profile for 1,1-Dichloroethene
http://www.atsdr.cdc.gov/toxprofiles/tp39.html

Toxicological Profile for Vinyl Chloride
http://www.atsdr.cdc.gov/toxprofiles/tp20.html

Comment:

The removal of contaminated soil to be replaced with clean soil sounded like a potential thing rather than a sure thing. My comments getting under the wire on the last date are: contaminated soil removal should be a definite part of the clean-up plan AND continual monitoring run-off into the surface water collection non-defined pond in the contaminated site area is required in the clean-up plan.

EPA's Response:

The removal of contaminated soil and sediments, followed by the back fill of clean soil is the remedy and will be carried out. Run-off will be controlled to prevent contamination from being spread during the construction activities. The cleanup goal determines what concentration will be used to decide whether soil is removed or not. The cleanup goal will depend on the future use of the land. If the land will only be used for industrial or commercial uses and a restrictive covenant can be placed on the deed, then the industrial cleanup goal will be used. If the land is residential land, or may become residential land in the future, then the residential cleanup goal will be used.

Comments from Residents received by email, phone, and at public meeting regarding other sites.

A number of comments were received about other sites in the area. While the companies that operated the former ITT-Thompson Industries Site may have been involved with waste disposed off-site, this ROD is focused on the contamination emanating from the Site. The other sites mentioned were the Madison County Landfill Superfund Site and a reported illegal dump operated several miles from the former facility. The EPA Remedial Project Manager for the Madison County Landfill Superfund Site is Joe Alfano. He can be contacted at Alfano.Joe@epa.gov and at (404) 562-8933.

The information on the reported illegal dump has been forwarded to EPA Superfund Site Assessment and to the FDEP for further investigation. Concerns about groundwater contamination near the reported illegal dump have been forwarded to the FDEP and to the Florida Department of Health (FDOH) for investigation. More information on the FDOH activities contact Randy Merchant at Randy_Merchant@doh.state.fl.us or (850) 245-4249.

3.3 Public Meeting Comments

The following comments and responses are excerpts from the Proposed Plan Public Meeting transcript. The full transcript is available at the Information Repository located at

MR. BURNETT: What about those tanks that are in that building underneath that floor, the three tanks in that building underneath that floor? I was over there the other day and got to look at them, that building you're talking about?

MR. SPALVINS: Right, right.

MR. BURNETT: You have three tanks underneath that floor.

MR. SPALVINS: Inside the building?

MR. BURNETT: Inside the building.

COURT REPORTER: And what is your name, sir?

MR. BURNETT: Billy Burnett. I was over there the other day. It's about to fall down, and there are tanks underneath that floor.

MR. SPALVINS: I'm not -- I'm not a hundred percent sure. We have a series of -- we've had a series of investigations at the site, and throughout the years, there have been samplings conducted inside the building. And I don't have the answer to that right now, but I can find out and let you know.

MR. BURNETT: What was stored in those tanks?

MR. SPALVINS: I can find out.

MR. BURNETT: I can tell you, it looked like pretty large tanks.

EPA's Response:

There may be tanks stored in the building for the ongoing pilot study. Previous investigations identified storm drains and other subsurface features. These were cataloged and investigated in the 1990s. EPA will inspect the buildings for signs of tanks in the floors during the next site visit, expected in early 2010.

MR. LEONARDSON: My name is Brian Leonardson. You say "under EPA supervision," is that on-site supervision?

MR. SPALVINS: Well, no, not always.

MR. LEONARDSON: So it's not really supervision?

MR. SPALVINS: Well, it is supervision. I mean, they send me a work plan, and I have complete ability to come down and -

MR. LEONARDSON: But you have no way of knowing if what they tell you they did, they really did.

MR. SPALVINS: Well, we do perform in-person oversight occasionally. The state's right down the street in Tallahassee, but I don't come to the site every time they do work in the site.

But these people are professional geologists, and I would -- and the way it works is ITT hires a professional geologist that has a license to do work, and this is the person's livelihood. If they conduct any kind of fraud, that person is subject to lose their licence.

And if I come out here and find out that something didn't happen the way it should have happened, not only will the company get a fine that they agreed to, which can be $10,000 a day, the person that perpetrated that fraud is probably going to lose their license to operate and lose their livelihood. So --

MR. LEONARDSON: So it's not ITT, per se; it's geologists hired by ITT?

MR. SPALVINS: That's right.

MR. LEONARDSON: Okay. Thank you.

MR. HAYNIE: Bill Haynie. Is there somebody from EPA, or some government agency, to come out and inspect all this work, or see if it's the work that's supposed to have been done and is actually accomplished?

MR. SPALVINS: Yes. I come down here when I can to do oversight. I can also hire a subcontractor to do the oversight. But one of the preconditions -

MR. HAYNIE: Now, you can build a house, and they're going to be out there inspecting it.

MR. SPALVINS: I understand. One of the preconditions to being able to use this approach is that the company is cooperative, and they've demonstrated that they're going to be able, and they're going to do this work in a trustworthy manner; and we have had -- we've had no problems with them performing this work.

Now, the folks that are involved in this cleanup from ITT are totally different from the folks that were involved in running the facility, and I don't know how many years ago that was. But ITT has a cleanup, a cleanup division, and they do good work, and they appear to be completely honest folks doing this work.

MR. HAYNIE: Well, is there -- in the process of doing all of this investigation and everything, was there any determination of who was the responsible person for violating EPA's rules, or whatever, that caused all of those problems to happen?

MR. SPALVINS: In a lot of cases with old manufacturing facilities like this, the problems occurred before we had a lot environmental regulations. Some of the -- I think the majority of the groundwater contamination here occurred from '70 to '74, and so we didn't have any environmental laws then.

So that's why Superfund exists because this is a way for companies that created serious problems in the environment to be held accountable to pay for the cleanup even though they didn't break any laws at the time the contamination occurred. So that's why the Superfund program exists.

MS. SPENCER: Excuse me. Can you state your name, please, for the record. State your name.

MR. HAYNIE: Oh, Bill Haynie. My name is Bill Haynie.

MR. HAYNIE: Is that ITT, that's -- the one that's cleaning it? Before you said there was...

MR. SPALVINS: I don't have an exact answer for you. The property, the facility, was operated by different groups. ITT bought the facility at one point and operated it for several years, and then sold it, I think. So I don't know.

MR. MOFFSES: They leased it, didn't buy it.

MR. BARNHART: I heard you mention chromium, and it's on the January 15th sheet from your website to cleanup the site summaries, but it doesn't say what kinds of chromium. I understand there's different types.

MR. SPALVINS: There are two kinds of chromium. There is a more toxic type of chromium, and there's a less toxic. The more toxic type doesn't last very long in the natural environment because it reacts quickly and that's what makes it toxic.

If you're exposed to that type of chromium, it can cause a lot of problems because it reacts quickly with organic matters. By the same token, once it's released into the

environment, it tends to react very quickly with whatever is around it. So this chromium that was discharged probably was the less reactive, less toxic form, even before it was --

MR. BARNHART: But did you analyze it in your studies to find out which kind it was?

Is there a word that would go with it to tell us which type of chromium?

MR. SPALVINS: I don't recall, based on my review of the final, whether that was hexavalent -- it's called "hexavalent" or "trivalent" chromium.

MR. BARNHART: Assuming, because you listed it here, there must be a problem?

MR. SPALVINS: Well, there may be the less toxic form there, and it's still a problem. So just because -- I mean, just because it's listed, that doesn't mean it's the most toxic form, okay.

MR. BARNHART: Wouldn't it be helpful if we knew that because we would know.

MR. SPALVINS: Well, the cleanup level is based on the most toxic form. Even though what we're dealing with is probably the less toxic form, we're going to clean up to the level of the more toxic form. And because of the way we test for it, we'll see it regardless of what form it's in. So we're going to address it to the most protective level. Although we don't think any of that more toxic form is present here.

MS. GREEN: Marianne Green. Would you please explain that item about arsenic above the, whatever it was, level.

MR. SPALVINS: Sure. Oh, I'm sorry. In soils we had volatile organics. We also had arsenic in some of the surface soil, and that's above the residential Floridan, which is the soil cleanup target level, is what it means, and that's the state level. Below which they don't expect any negative impact.

And now the arsenic here, the arsenic is --actually, it's in a relatively limited area, and it's high.

MR. CURTIS: What they're doing now, which you're about to tell us about now is happening, why didn't they just do that in 1997?

MR. SPALVINS: Well, this technology, the technology that we're using, is something that's been in development. It's relatively new, and it's something that, you know, the EPA wasn't -- I don't think anybody was sold on this technology.

A long time had passed between '99 and today, was spent with biological surveys of the aquifer material to evaluate whether this natural decomposition was occurring. There was a -- we were doing monitoring on a regular basis here of the groundwater to make sure we understood where it was and how it was moving.

So during that period of time, we were building a scientific case so that we would be able to choose something that would work.

MR. CURTIS: Well, I'm not trying to imply that we're stepping over a burning man to decide which faucet to turn on. But I was curious, because of a few little e-mails, is part of it to see what Mother Nature will do as part of the protracted process, to see what the Earth itself might do to kind of clean things up?

MR. SPALVINS: In some way, yes. But at the same time, if there was an eminent threat, then we would have taken an action immediately. But because we have people on water supply, we eliminated the immediate exposure to people drinking contaminated water.

So that was really the first, the first step. And a lot of the focus and energy that was expending in the early 2000s was, you know, to try to make sure everybody was getting connected to the public water supply.

MR. BURNETT: I want to know exactly how much money ITT, in cash money, has spent trying to clean this thing up since they found it was a problem?

MS. SPENCER: State your name, please.

MR. BURNETT: That's what I want to know. How much cash money have they written a check for? Not their lawyers, not anything else, how much cash money has ITT spent out of their checkbook cleaning this thing up?

MR. SPALVINS: I don't know. Because when I see their reports, or when I tell them what I need them to do, I don't ask them how much it's going to cost. I say, This is what you need to do. And if they have a problem with paying for it, then I have options available to me to make sure they do it. Now, you might be able to get an answer from them -

MR. BURNETT: As citizens we need to know whether they're BS or cash, and there's no in between. You either pay money and you're wanting to address the problem, or you run your mouth to try to cool your way through it.

MR. SPALVINS: Well.-

MR. BURNETT: The question is, it sounds like to me that it's BS.

MR. SPALVINS: Well, let me finish my presentation before you make that conclusion.

MR. BARNHART: I just have one more question.

MR. SPALVINS: Sure. Go ahead.

MR. BARNHART: Barry Barnhart. Would you fish in that pond, is one question?

MR. SPALVINS: Yes.

MR. BARNHART: Okay. Has there been any studies on the fish flesh to see what the concentration of any of these chemicals are? Fish accumulate through the food chain, you know what I mean?

MR. SPALVINS: Right. The question is: Are the fish safe in the pond, right, in Mill Pond? And we don't have any indication that there's a problem there. The level of -- this -- can we go back one. One more.

This screen criteria that was exceeded for vinyl chloride, that's the number that the fish is in water containing that much vinyl chloride its whole life, and you eat it, it might cause a problem.

MR. BARNHART: On a regular basis?

MR. SPALVINS: On a regular basis. That's if you eat so much fish every day for so long.

We exceeded vinyl chloride in one sampling point in a big pond. Now, we sampled it in several places. Now, I know that there aren't any fish that are just going to stay at one spot in the pond, so I'm not concerned that, you know, from that. And, also, that was one point, one time we sampled. Everything else was fine. So, I'm not concerned that the fish is a problem in that pond.

MR. BARNHART: And you took bottom samples as well?

MR. SPALVINS: We took sediment samples, and we took the pore water samples, which is the water coming through the pores into the surface water. Into the surface water.

MR. BARNHART: Is that public record so we can get a copy?

MR. SPALVINS: Yeah. I believe it's in the

MS. SPENCER: -- the Repository. That's in the Repository.

MR. SPALVINS: I think a summary of that information is at the library in the Information

Repository. Yes, sir.

MR. PICKLES: I know you're trying to move on. But before you move that slide, could you clarify for us which of those represents the greatest threat to the public?

MS. SPENCER: State your name, please.

MR. PICKLES: David Pickles.

MR. SPALVINS: Yes. The thing that's driving the cleanup mostly is the groundwater contamination. Because the soil contamination is going to be if you're on the soil, living on the soil, eating the soil, that's how you'll get exposed to that.

The sediment contamination is an ecological problem. The ground water contamination is the contamination that goes out and is something that people could potentially be exposed to.

In this case, there's a public water supply; there's an ordinance that if you, you know, if you need to hook up to a new -- if you have a new construction, you hook up to the public water supply. So it eliminated that route for people to get exposed to it; but the potential exists that in the future it could happen.

Also the Superfund Program has a goal of return groundwater to a beneficial use. So that's -- I hope that answers your question.

MS. SOOTKOOS: Joan Sootkoos, S-o-o-t-k-o-o-s. How many times was the land injected with the molasses?

MR. SPALVINS: I think we did, I think, we were on 17, or something. We've done it 16 or 17 times.

MS. SOOTKOOS: Between 2004 and 2007?

MR. SPALVINS: And today. The last one was just a couple of months ago.

MR. SHIRLEY: We're at 20.

MR. SPALVINS: We're at 20 now. So we have started out doing it on like, I think, every couple of months. We started out very intensively to see what would happen; and as we started to get the right conditions in place, we were able to do it a little bit less often.

MS. SOOTKOOS: And I have one other thought.

When we're talking about groundwater, I think of the water underneath that's always moving; and I'm wondering why there's so much contamination in the groundwater.

Could there be a possibility that it was an oversight that maybe some barrels of things were buried on the property? And there's some kind of a point source of pollution like on the love canal here?

MR. SPALVINS: Right. That's a good question.

MS. SOOTKOOS: Was the soil ever checked or dug up?

MR. SPALVINS: That's a good question, and we did do soil sampling around the facility and found that the areas right behind the loading dock was the area that was acting as the source.

And in terms of the way the groundwater is moving and the contamination is moving in the water, the contaminants don't move the same rate as the water does.

So I don't know -- I -- I'm trying to figure out a way to maybe visualize that. But these compounds are only -- are only -- they don't dissolve very readily in water. They're called --characterized as dense, a Non-Aqueous Phase Liquid.

So it's a liquid that doesn't dissolve very well in water and moves down in water, and it's not dissolved. And so it's kind of like an oil and vinegar mixture. And so that's why at the source area, you may have little pieces of this that aren't quite dissolved that will constantly bleed off very low -- relatively low concentration contaminants into the groundwater that's moving through it without carrying that away. And that acts as a source, and that's what's going on in the back area behind the facility.

Now, in terms of the rest of the contamination, it's moving out, it doesn't -- it moves at a fair speed. But, you know, relative to arsenic, movement's known as very slowly. And so that's why we see that there's still a plume that exists.

The key will be over time, and we'll monitor this directly. Now, we'll be monitoring over it many years to make sure that we don't see an increase in the contamination; and if we do, then we'll go back and get back to cleaning it up.

MR. SESSIONS: Yeah, Tony Sessions. Have you been able to determine how far the contamination has moved out? Or has it been contained in the general site you're working in?

MR. SPALVINS: Can we go back to the big overhead map at the beginning.

It starts with: (1) It's determined the groundwater contamination was up here in this area. So we saw it as far as up here from this site. But since then, it's been coming back. So that -- and today it's about here (pointing).

MS. SOOTKOOS: I have one other question to ask. And that's what I wanted to see. It was kind of looking at like a report card. And then that is their goal, the cleanup goal.

MR. SPALVINS: Right.

MS. SOOTKOOS: And now you've got them in some kind of order there, where is the deadline? And then where is the consequence if they don't reach that deadline?

Is there some kind of a time frame? Are they given a time frame? And then if they don't meet the time frame, is there a consequence? Or do they have --

MR. SPALVINS: I mean, they -- it's -- we expect that this is going to be relatively quick, which is one of the good things about this approach with the -- especially the groundwater. We're going to see cleanup here I think pretty quickly. Is it going to be seven years? Is it going to be five years? Or three years? I don't know for sure.

But, again, from 2004 to 2007, we saw significant cleanup around the source area. So I think we'll see pretty good results. And the cleanup has to continue until we have -- until we have achieved the goals. Yes, ma'am.

MS. SOOTKOOS: And -- and for my last question, and I will stop. To sell their property, can they try to sell their property at this point? Or now that it's in the Superfund, are they --

MR. SPALVINS: Well, the property owners have a responsibility to let somebody know that there's a problem there. But right now, I -- there's no, nothing from EPA that would say you can't sell this property. But they would want to work with the EPA to make sure that if they sold it, that it was going to be used in a responsible way.

Now, once the cleanup is done, it will be a lot easier to approach that kind of thing.

MS. GREEN: Marianne Green. I would like to speak up for the EPA. In the things I read, the recommendation is that there be restrictions on the deed. They weren't sure that the landowners would agree to that, but that's not strictly EPA's fight about it. That's in the library records.

MR. SPALVINS: That is one possibility. If -- I mean, it depends on what -- I mean, it depends. If there's an industrial cleanup level and there's a residential cleanup level, because there are different types of exposure.

There's a difference between living somewhere for 60 years, or 70 years, and working somewhere for 30 years five days a week. So there are different numbers for the cleanup there.

And, you know, depending on the levels that we can achieve in a cleanup, it might be impacted, fully used. Or if we can't be sure that this property is going to be used only for industrial purposes, then we may decide that we have to go ahead and clean up to a higher level. It just depends on -- you want to make that decision appropriate with the facts as they develop. So we have some flexibility there.

MS. JOHNSON: Can this building be cleaned up? Jackie Johnson.

MR. SPALVINS: It is possible. That's where we're supposed --

MS. JOHNSON: I'm not talking about cleaning up; I'm talking about the way that the site looks.

MR. SPALVINS: Oh, the way the site looks?

MS. JOHNSON: Yes. Uh-huh.

MR. SPALVINS: Well, I talked to ITT about the building, and they've talked to the owners of the property about that, and I don't have any way to make anybody do anything in terms of the way the facility looks. But I suggest you talk to the folks that own the property and ITT about that. I would love to see it cleaned up, myself, but I don't have any power to make that happen.

MS. GREEN: Marianne Green. In other words, ITT would not be involved in the removal of the buildings, as the situation stands right now, only the clean up of the pollution?

MR. SPALVINS: That's right. That's going to be an arrangement between ITT and the property owners. If the -- if the buildings were presenting an environmental hazard, I could get

them removed. But they don't. They're an eyesore. Yes, sir.

MR. SPRADLEY: I understand. I understand your statement today: It means that the pollution starts from the plant. And the other part, you're not -- you're denying?

MR. SPALVINS: The --

MR. SPRADLEY: Even though they're the same type of pollution, but they're not connected in no way?

MR. SPALVINS: I didn't say that.

MR. SPRADLEY: Oh, you're not. Okay.

MR. SPALVINS: I'm saying that this process, this process to this document, the ROD. The cleanup that we're talking about here is with regards to that contamination originating at the facility in the groundwater and creating this groundwater contamination.

Now, we're in the cleanup; we're proposing a cleanup for the groundwater, the soil, and the sediment, and addressing any potential threats to Mill Pond.

MR. SPRADLEY: All right. Well, we're going to cut the baby in half and see which one lives.

MR. SPALVINS: We're going to clean up this part of the contamination, okay.

MS. JOHNSON: Can I ask you something? Did you investigate whether or not the contaminates had gone down to Lake Francis?

MR. SPALVINS: We did take samples in Lake Francis. We did not find levels of concern.

MR. SALE: What about the Suwannee River?

MR. SPALVINS: We did not take any samples of the Suwannee River. We did not take any samples of the Withlacoochee.

MR. PARSONS: When you were -- on whatever sampling you did to the aquifer, can you characterize what percentage of your investigation or sampling was in the aquifer itself as opposed to the surface layers? You know, 10 percent? 15 percent?

MR. SPALVINS: We have -- I don't really know how many -- I don't know. Can we get your name?

MR. PARSONS: Barry Parsons.

MR. SPALVINS: We have dozens and dozens of groundwater wells at different levels through the aquifer, and they start at the facility, and they go until we got to a clean groundwater sample.

So that's why we feel like we have a good delineation for the impact of the groundwater from this site. So we started from where the contamination was starting, and we put in wells, basically, until we found the end of the contamination in the aquifer.

How many wells it is? I don't know off the top of my head. I'm going to say - Pat, do you have an estimate?

MR. SHIRLEY: Fifty, sixty.

MR. SPALVINS: Yeah, 50 or 60.

MR. PARSONS: In a follow up to that, did you tune into whatever was in the aquifer? Was there any contaminates that were a surprise that you didn't expect would be coming from the ITT site?

Why I'm asking the question is: We have another water problem in this county, and all of North Florida, which is from the Valdosta plume--which is a whole other terrible situation up in Valdosta, Georgia--and they have a range of toxic contaminates that goes beyond what's here, and I just wondered if you saw any surprises in any of your samples that says this shouldn't be in ITT?

MR. SPALVINS: The way that our investigation goes is: We look at what is present at the site, at the source area, and then we look for those compounds, and those types of compounds, as we move out forward. So we weren't looking for every contaminant that could be in the aquifer. We were focusing on those that are related to the site.

5 9 0 1 6 5

FIGURES

Figure 1. Site Location Map.

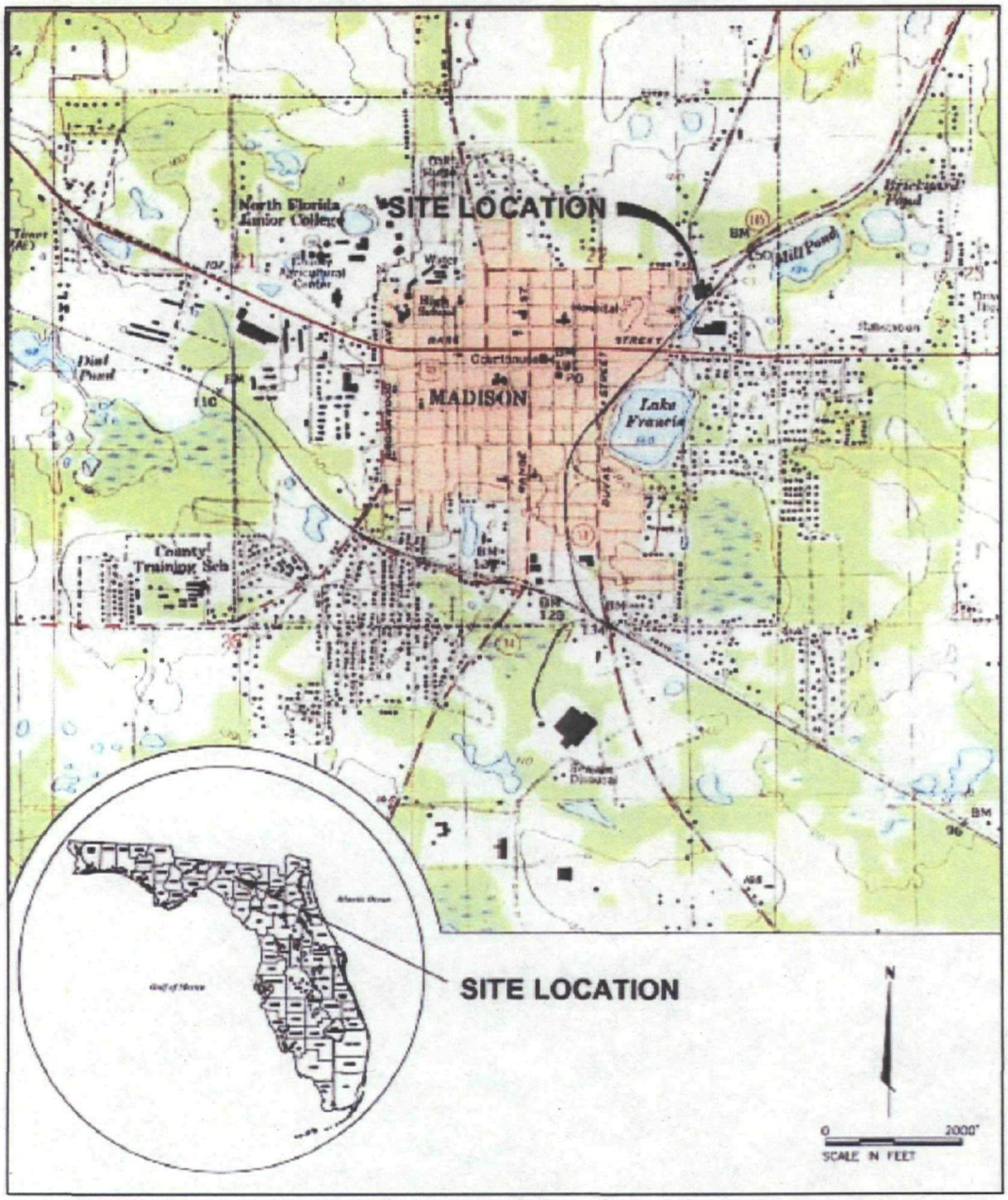


Figure 2. Site and Surrounding Area.

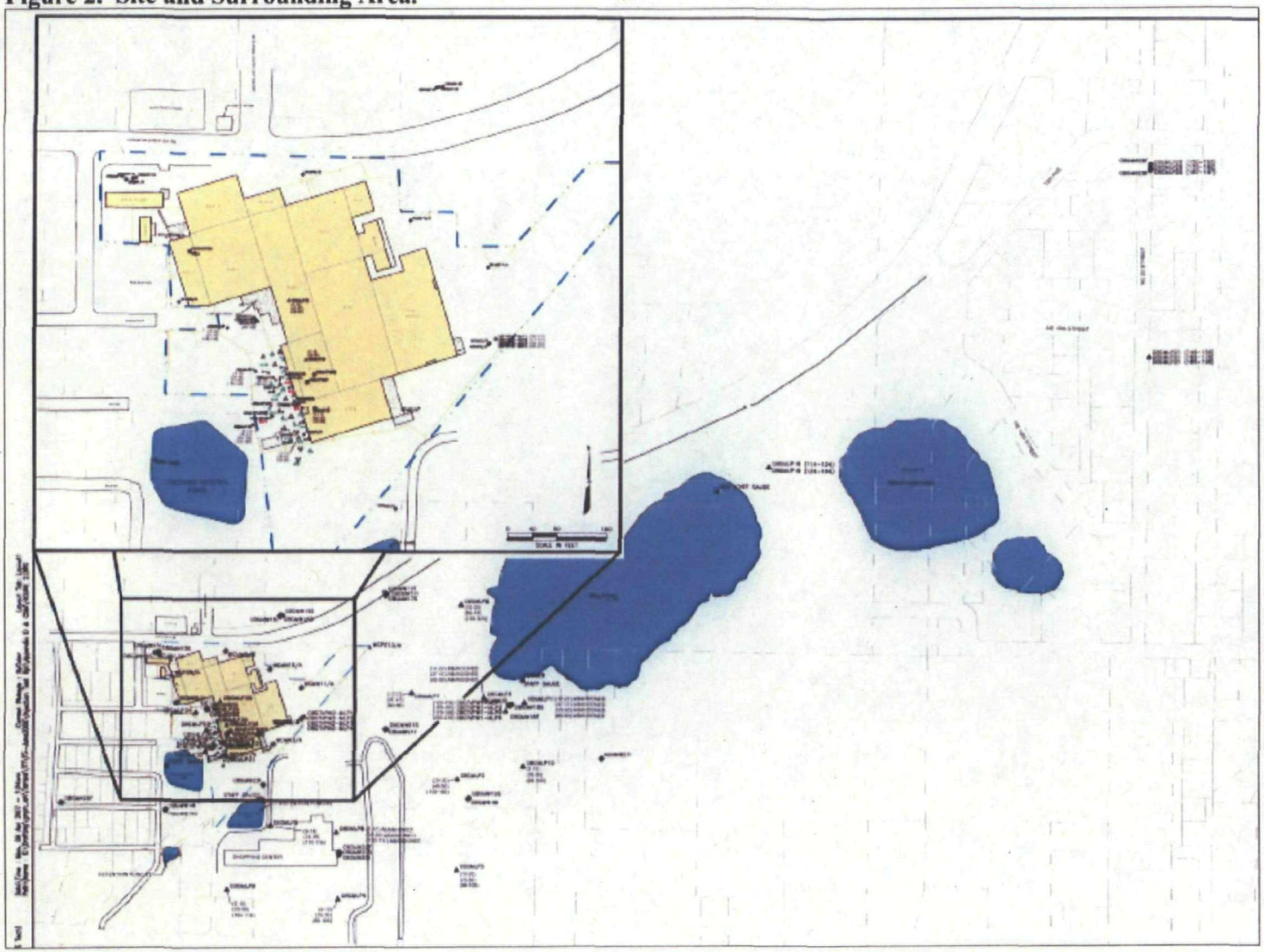


Figure 3. Site Conceptual Model used for Developing COPCs and Potential Exposure Pathways.

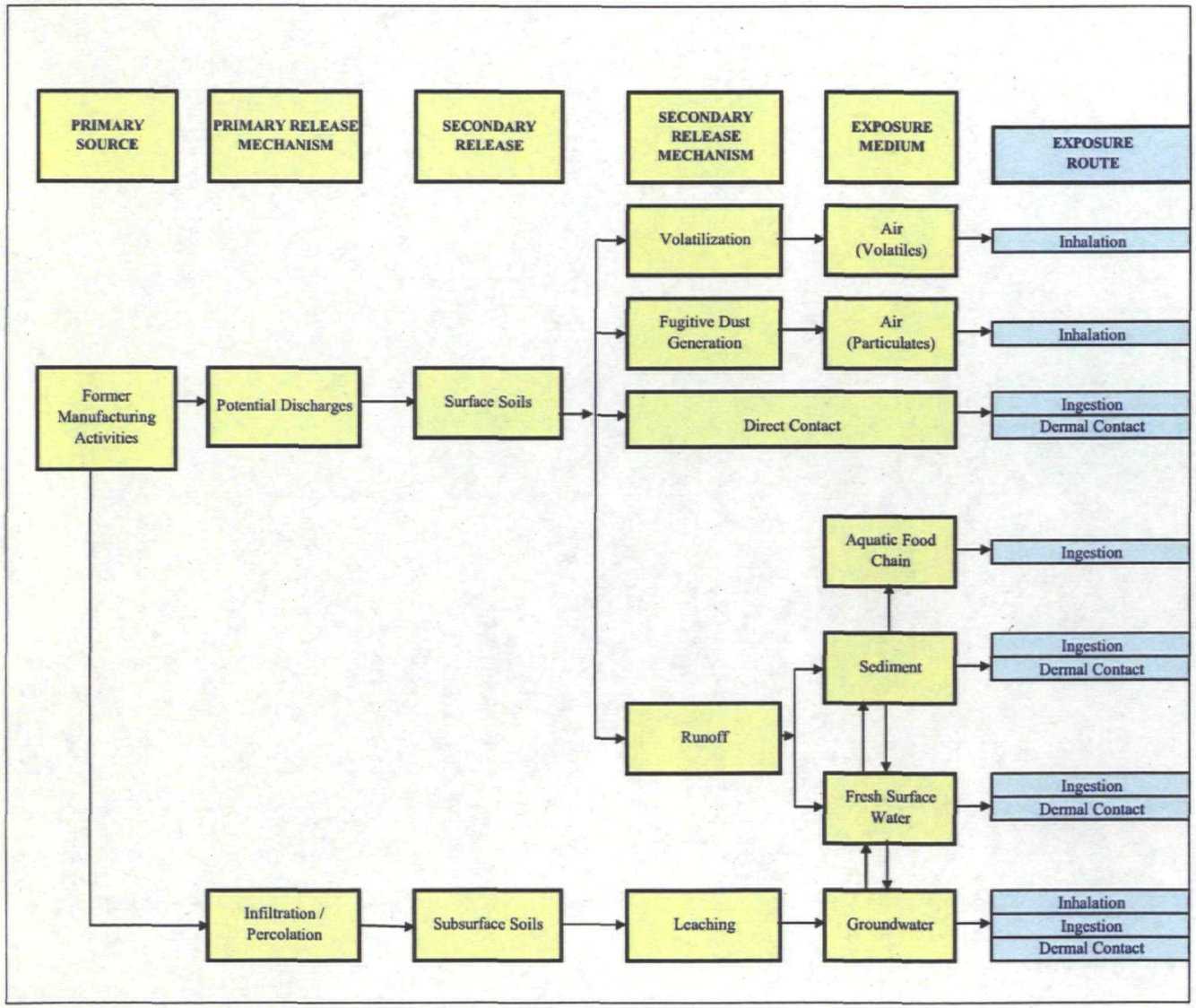


Figure 4. General Stratigraphy of the Site.

		NORTHERN FLORIDA		MADISON, FLORIDA
SYSTEM	SERIES	LITHOSTRATIGRAPHIC UNIT	HYDRO-STRATIGRAPHIC UNIT	SITE HYDRO-STRATIGRAPHIC UNIT
QUATERNARY	HOLOCENE	UNDIFFERENTIATED PLEISTOCENE-HOLOCENE SEDIMENTS	SURFICIAL AQUIFER SYSTEM	UPPER SURFICIAL
	PLEISTOCENE			
TERTIARY	PLIOCENE	MICCOSUKEE FORMATION CYPRESSHEAD FORMATION NASHUA FORMATION		LOWER SURFICIAL
	MIOCENE	HAWTHORN GROUP STATENVILLE FORMATION COOSAWHATCHIE FORMATION MARKSHEAD FORMATION ST. MARKS FORMATION	INTERMEDIATE AQUIFER SYSTEM OR CONFINING UNIT	TORREYA FORMATION
			FLORIDAN AQUIFER SYSTEM	EPIKARST
	OLIGOCENE	SUWANNEE LIMESTONE		UPPER PORTION OF THE FLORIDAN AQUIFER SYSTEM
	EOCENE	OCALA LIMESTONE AVON PARK FORMATION OLDSMAR FORMATION		
	PALEOCENE	CEDAR KEYS FORMATION		NOT INVESTIGATED
CRETACEOUS AND OLDER		UNDIFFERENTIATED	SUB-FLORIDAN CONFINING UNIT	

Figure 5. Cross-section of the Site Hydrostratigraphy (Parallel to Ground Water Flow Direction).

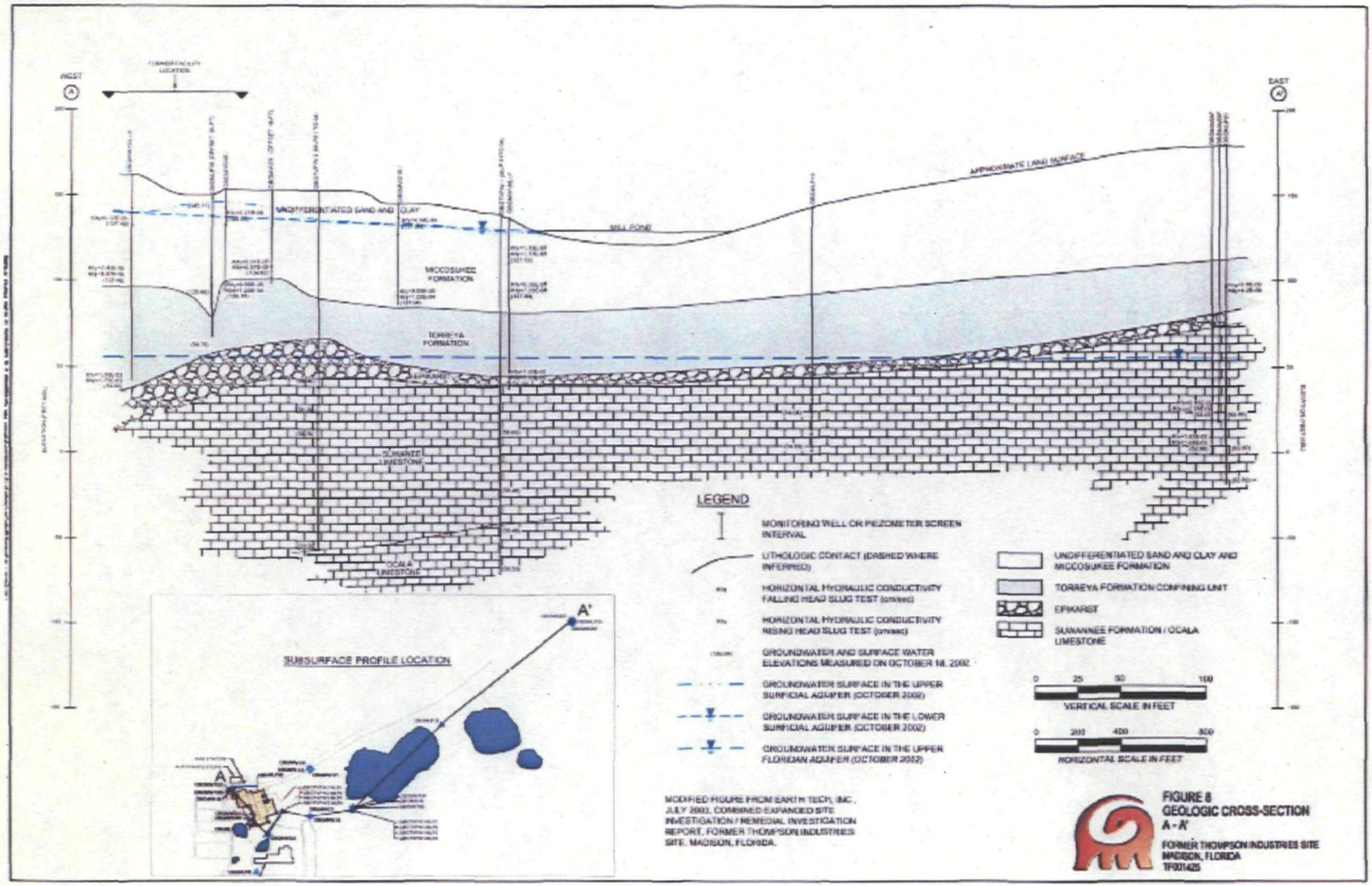


Figure 6. Cross-section of the Site Hydrostratigraphy near Cover Collapse Feature.

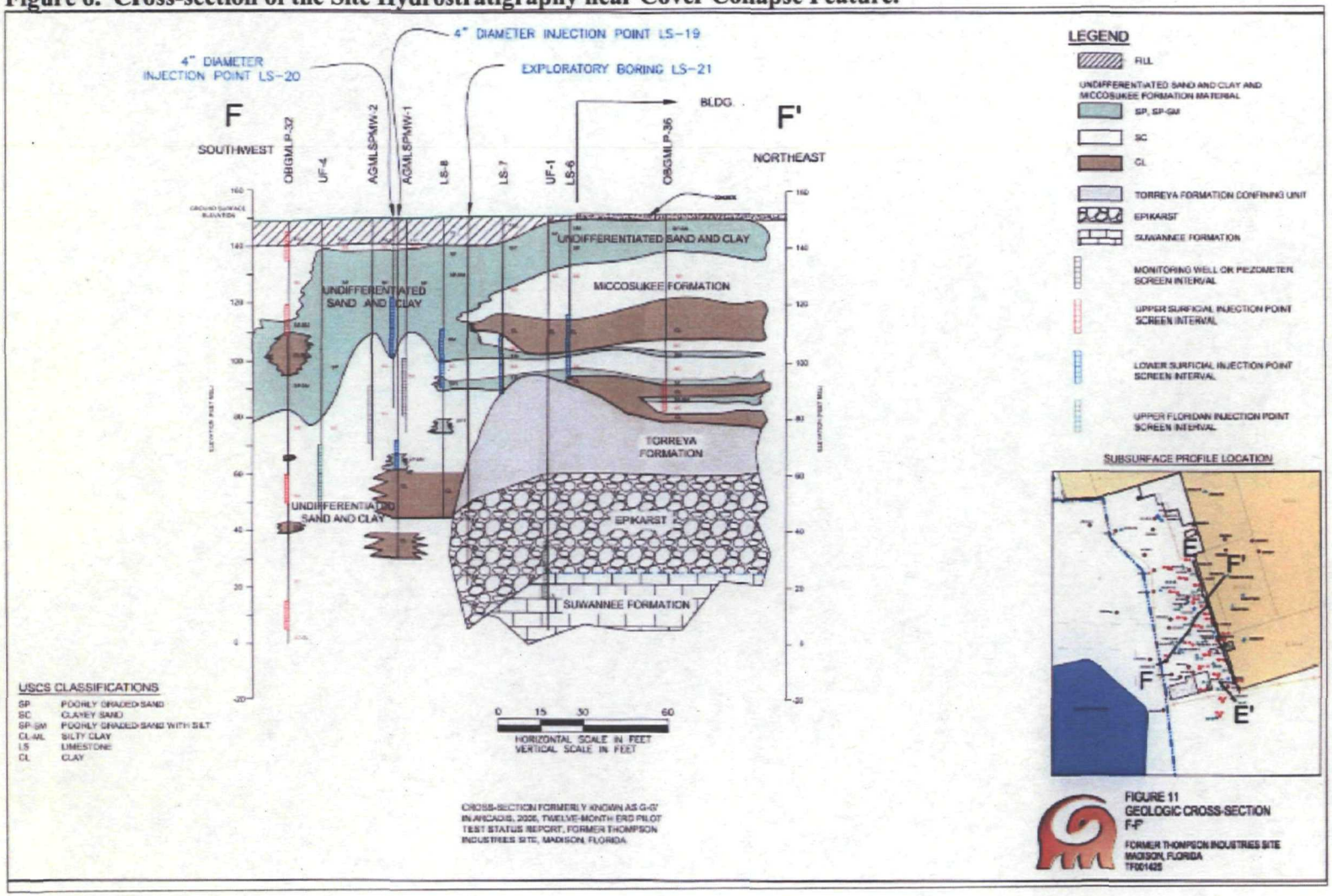


Figure 7. Soil Contamination.

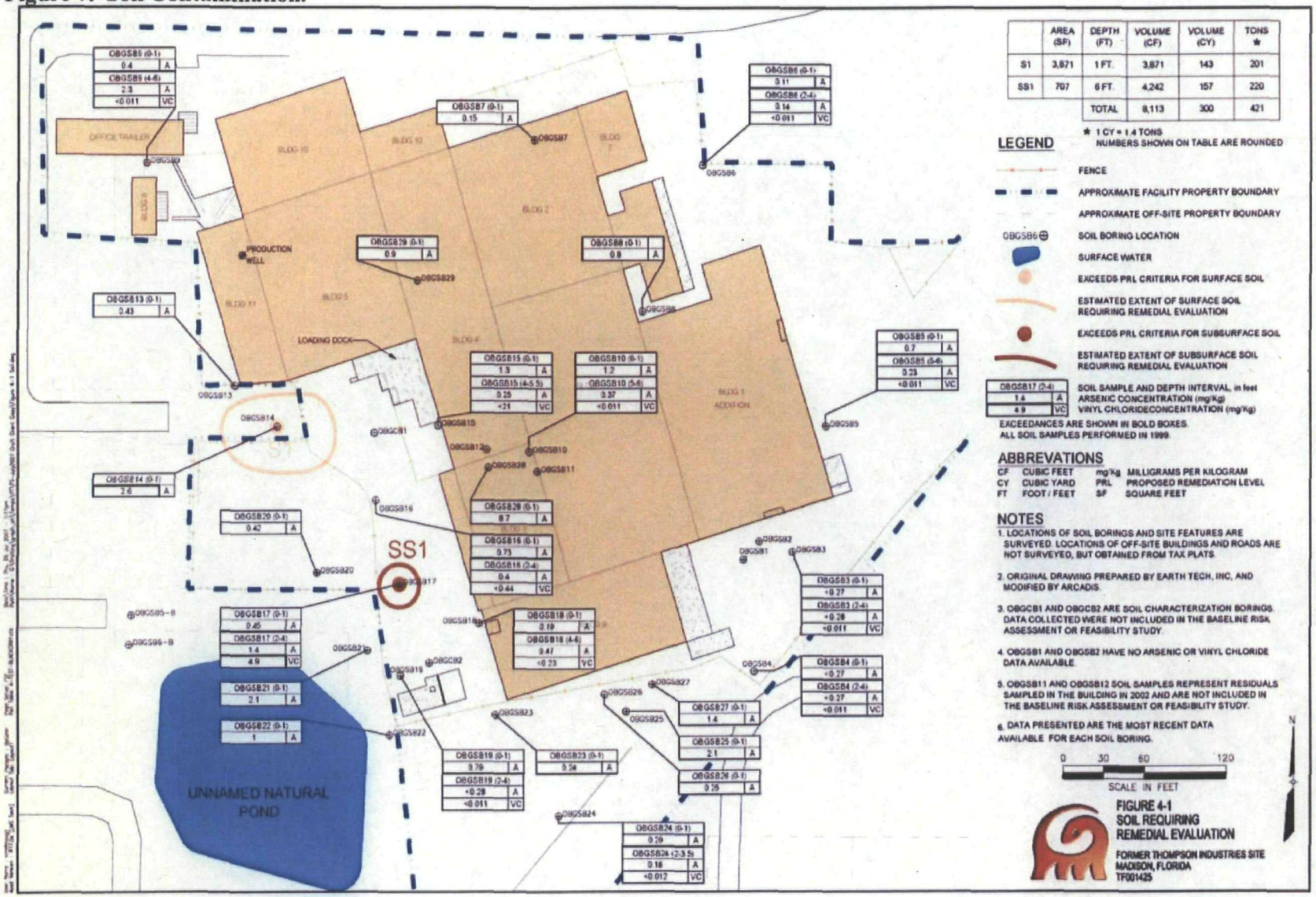


Figure 8. Sediment Contamination.

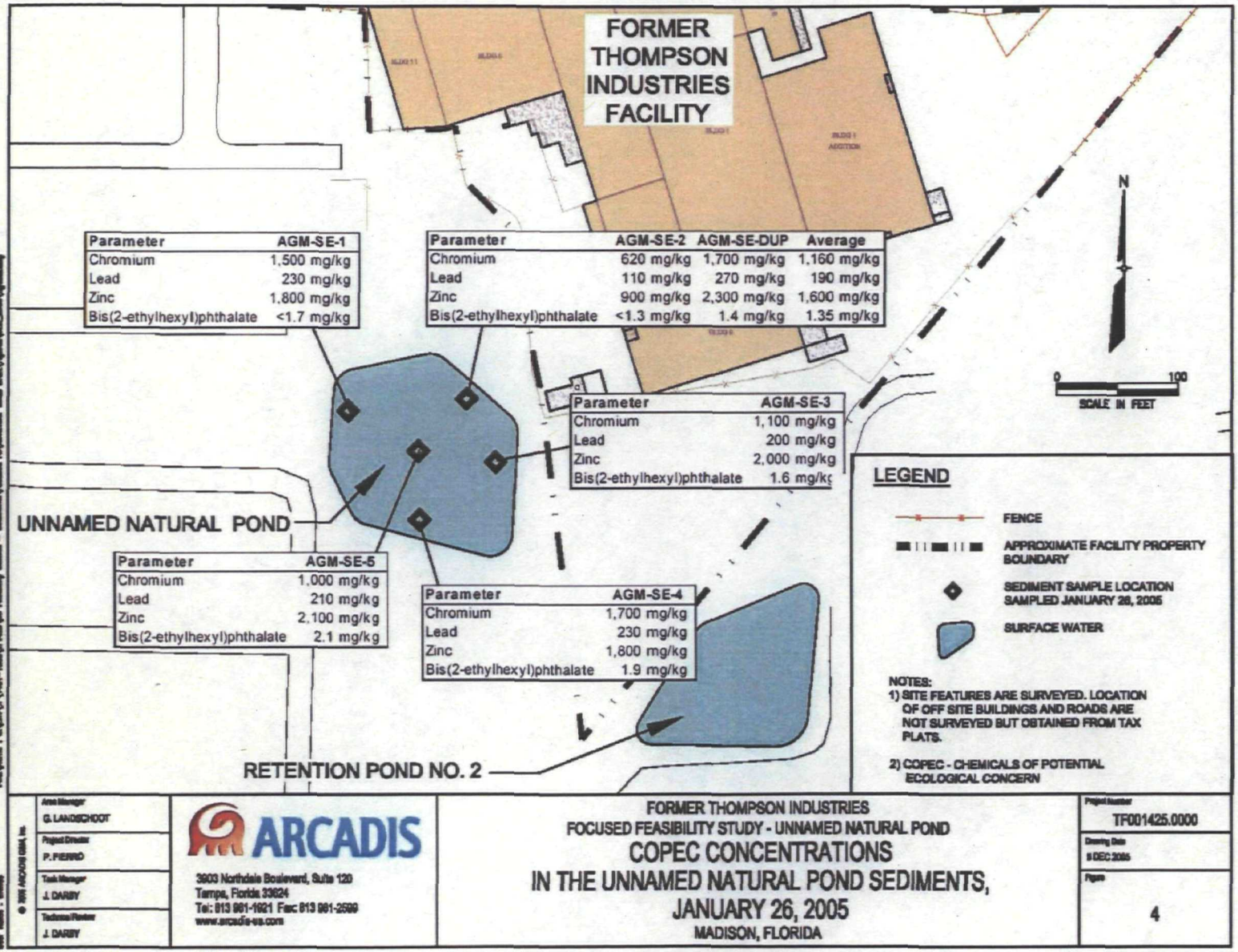


Figure 9. COC Concentrations in the LS Aquifer and Area Requiring Remediation.

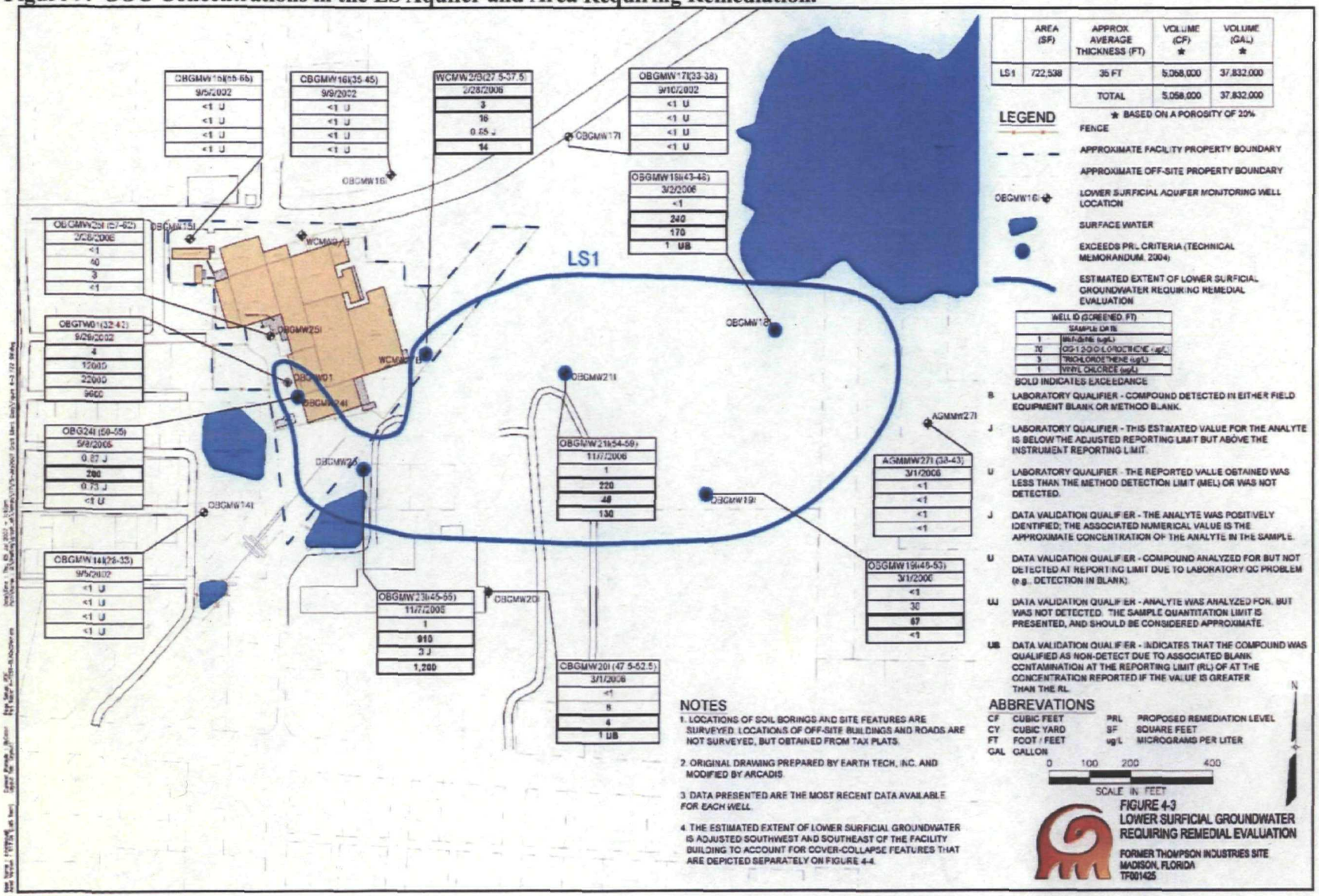


Figure 10. COC Concentrations in the US Aquifer and Area Requiring Remediation.

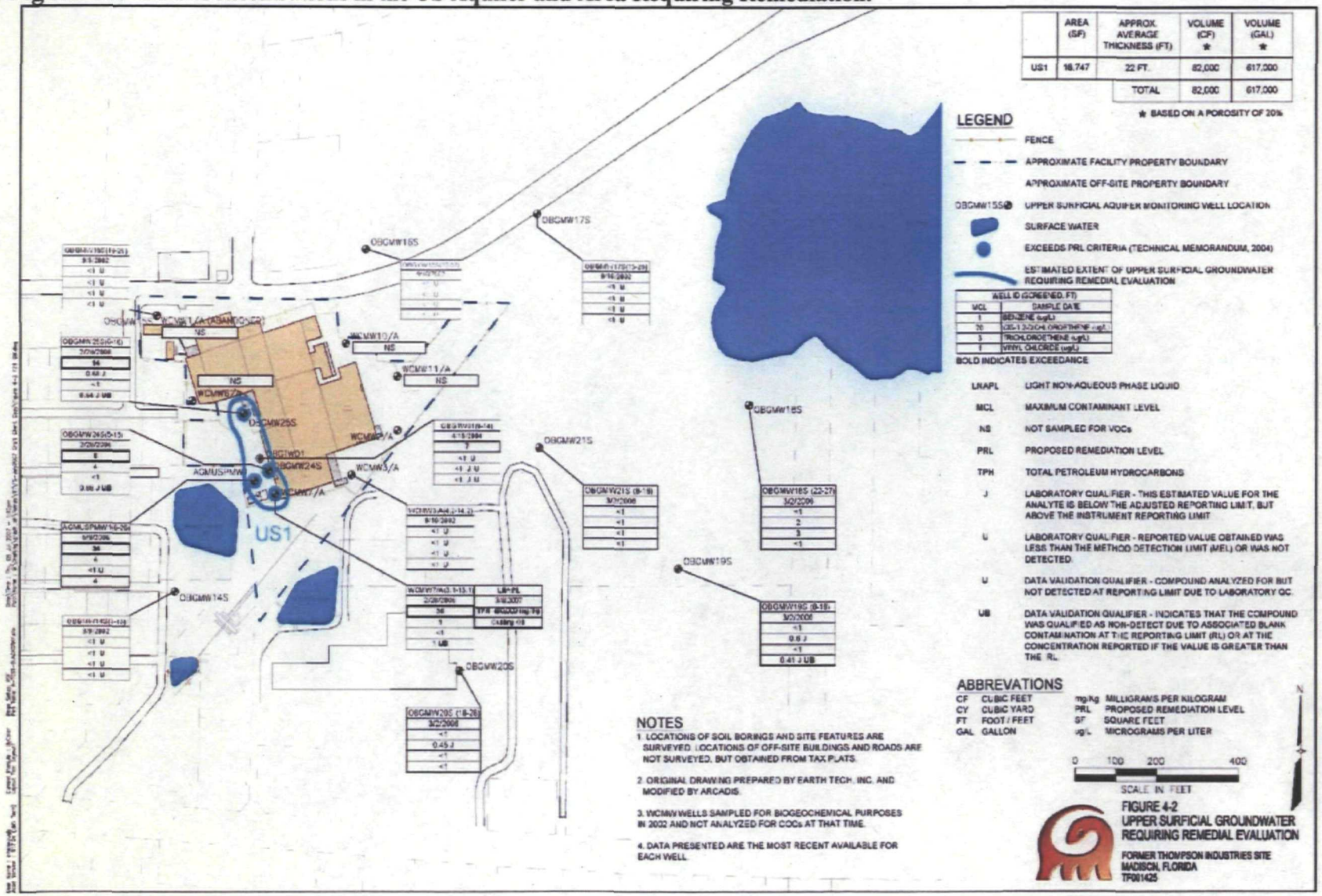
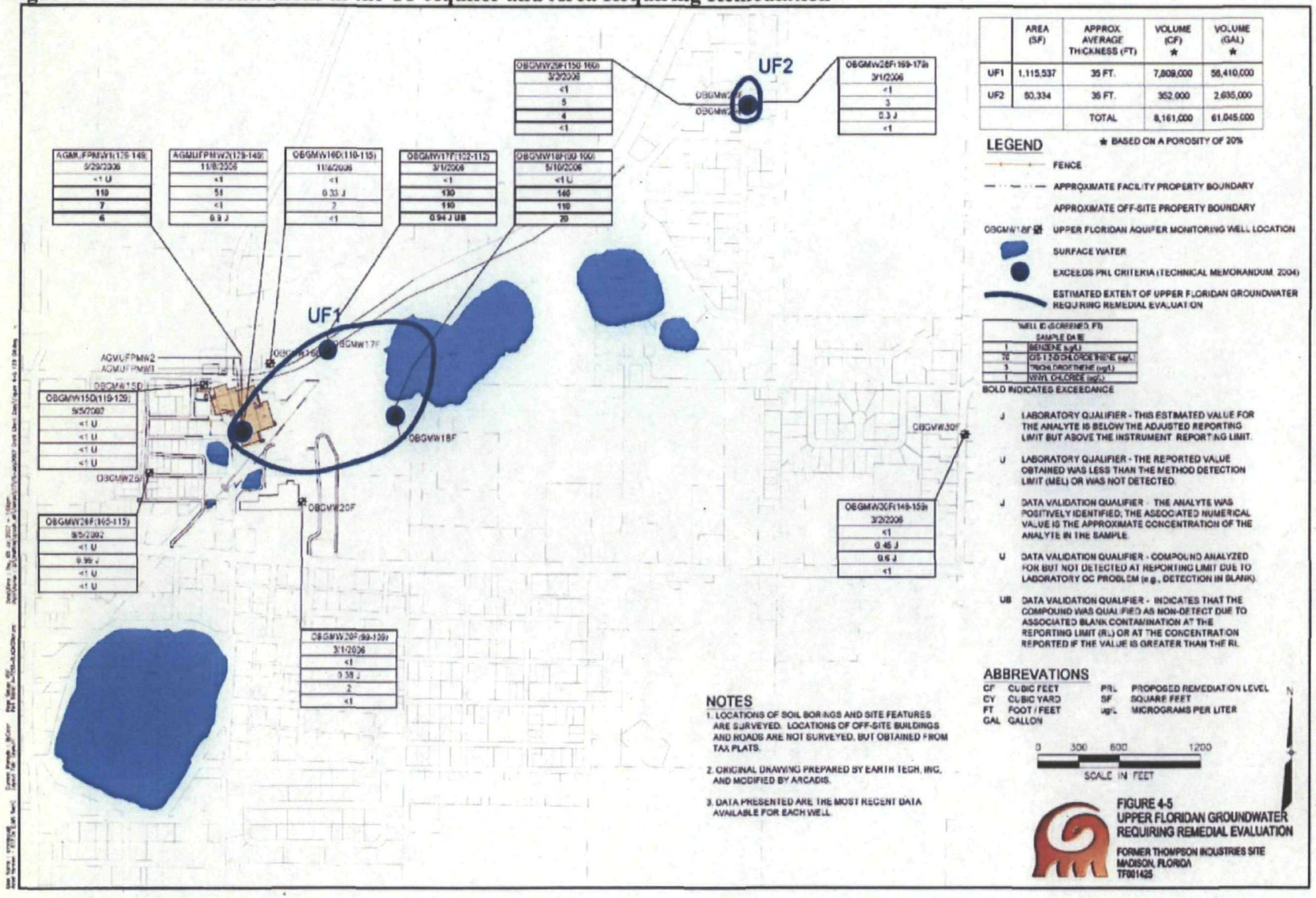


Figure 11. COC Concentrations in the UF Aquifer and Area Requiring Remediation



	AREA (SF)	APPROX. AVERAGE THICKNESS (FT)	VOLUME (CF) ★	VOLUME (GAL) ★
UF1	1,115,537	35 FT.	7,809,000	58,410,000
UF2	50,334	35 FT.	352,000	2,635,000
		TOTAL	8,161,000	61,045,000

★ BASED ON A POROSITY OF 20%

LEGEND

- FENCE
- APPROXIMATE FACILITY PROPERTY BOUNDARY
- APPROXIMATE OFF-SITE PROPERTY BOUNDARY
- OBGMW18F — UPPER FLORIDAN AQUIFER MONITORING WELL LOCATION
- SURFACE WATER
- EXCEEDS PRL CRITERIA (TECHNICAL MEMORANDUM, 2004)
- ESTIMATED EXTENT OF UPPER FLORIDAN GROUNDWATER REQUIRING REMEDIAL EVALUATION

WELL ID (SCREENED, FT)	SAMPLE DATE
1	BENZENE (ug/L)
70	CIS 1,2-DICHLOROETHENE (ug/L)
3	TRICHLOROETHENE (ug/L)
1	VINYL CHLORIDE (ug/L)

BOLD INDICATES EXCEEDANCE

J LABORATORY QUALIFIER - THIS ESTIMATED VALUE FOR THE ANALYTE IS BELOW THE ADJUSTED REPORTING LIMIT BUT ABOVE THE INSTRUMENT REPORTING LIMIT.

U LABORATORY QUALIFIER - THE REPORTED VALUE OBTAINED WAS LESS THAN THE METHOD DETECTION LIMIT (MEL) OR WAS NOT DETECTED.

J DATA VALIDATION QUALIFIER - THE ANALYTE WAS POSITIVELY IDENTIFIED; THE ASSOCIATED NUMERICAL VALUE IS THE APPROXIMATE CONCENTRATION OF THE ANALYTE IN THE SAMPLE.

U DATA VALIDATION QUALIFIER - COMPOUND ANALYZED FOR BUT NOT DETECTED AT REPORTING LIMIT DUE TO LABORATORY QC PROBLEM (e.g., DETECTION IN BLANK).

UB DATA VALIDATION QUALIFIER - INDICATES THAT THE COMPOUND WAS QUALIFIED AS NON-DETECT DUE TO ASSOCIATED BLANK CONTAMINATION AT THE REPORTING LIMIT (RL) OR AT THE CONCENTRATION REPORTED IF THE VALUE IS GREATER THAN THE RL.

NOTES

1. LOCATIONS OF SOIL BORINGS AND SITE FEATURES ARE SURVEYED. LOCATIONS OF OFF-SITE BUILDINGS AND ROADS ARE NOT SURVEYED, BUT OBTAINED FROM TAX PLATS.
2. ORIGINAL DRAWING PREPARED BY EARTH TECH, INC. AND MODIFIED BY ARCADIS.
3. DATA PRESENTED ARE THE MOST RECENT DATA AVAILABLE FOR EACH WELL.

ABBREVATIONS

CF	CUBIC FEET	PRL	PROPOSED REMEDIATION LEVEL
CY	CUBIC YARD	SF	SQUARE FEET
FT	FOOT / FEET	ug/L	MICROGRAMS PER LITER
GAL	GALLON		

0 300 600 1200
SCALE IN FEET

N

FIGURE 4-5
UPPER FLORIDAN GROUNDWATER REQUIRING REMEDIAL EVALUATION
FORMER THOMPSON INDUSTRIES SITE
MADISON, FLORIDA
TF001425

Figure 12. Conceptual Site Model Showing the Potential Exposure Pathways for the BHHRA.

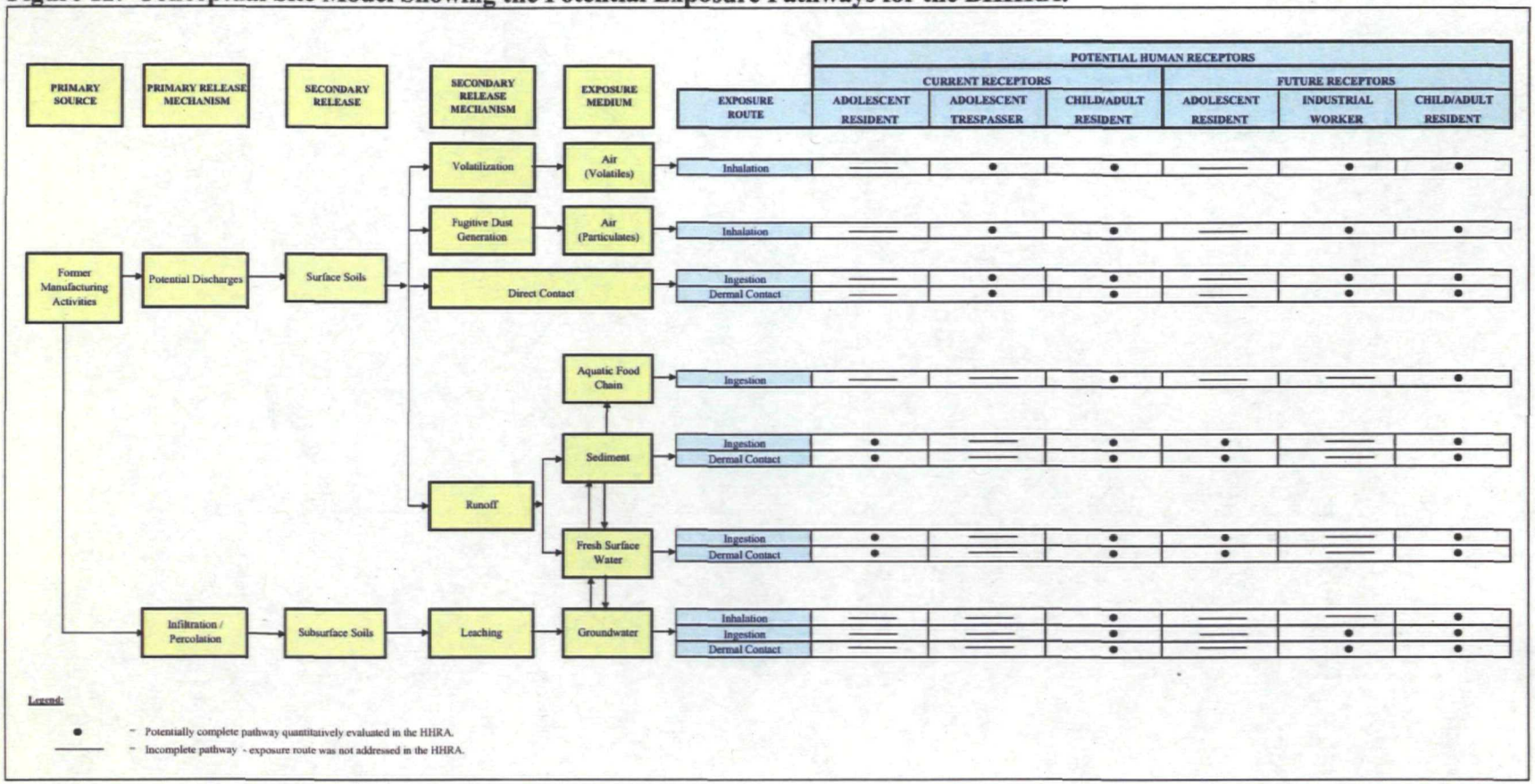


Figure 13. The conceptual layout of Soil and Sediment Alternative 3.

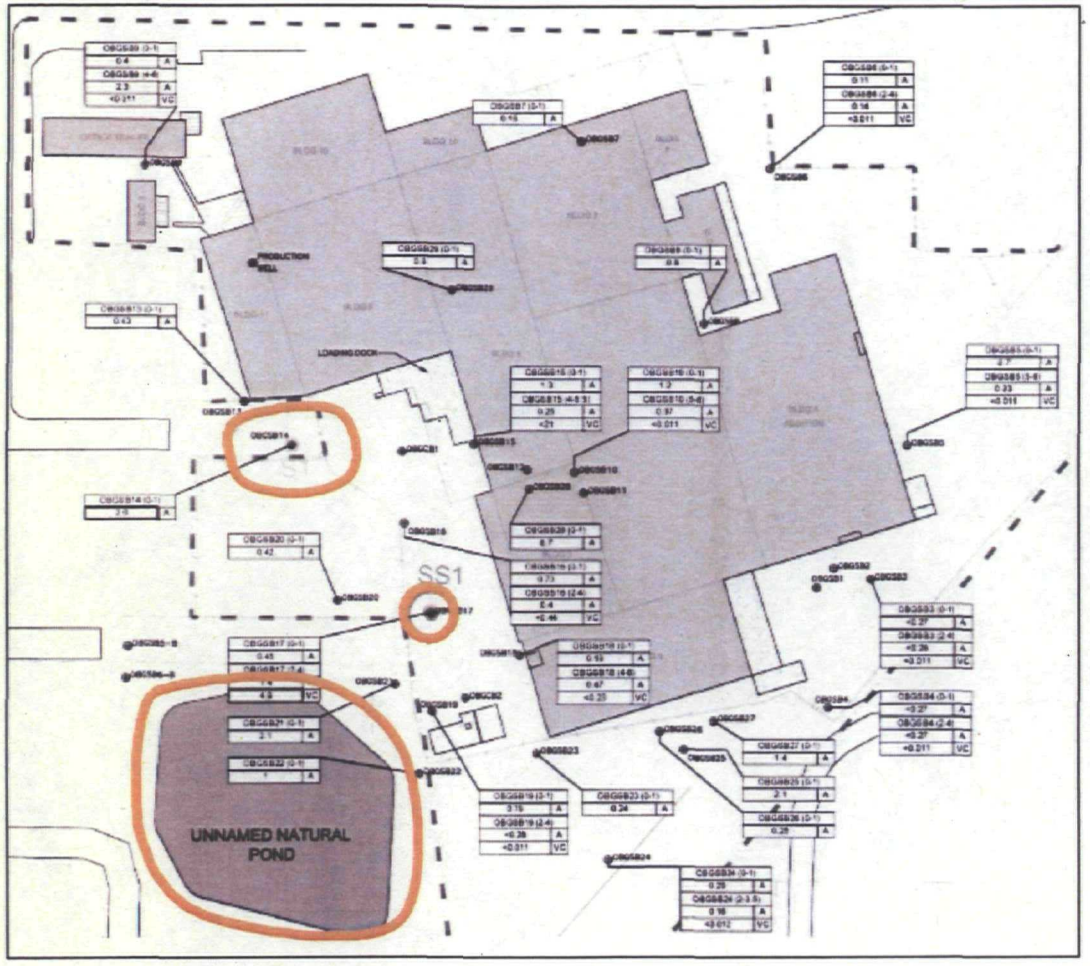


Figure 14. Physical Layout of Ground Water Alternative 6.

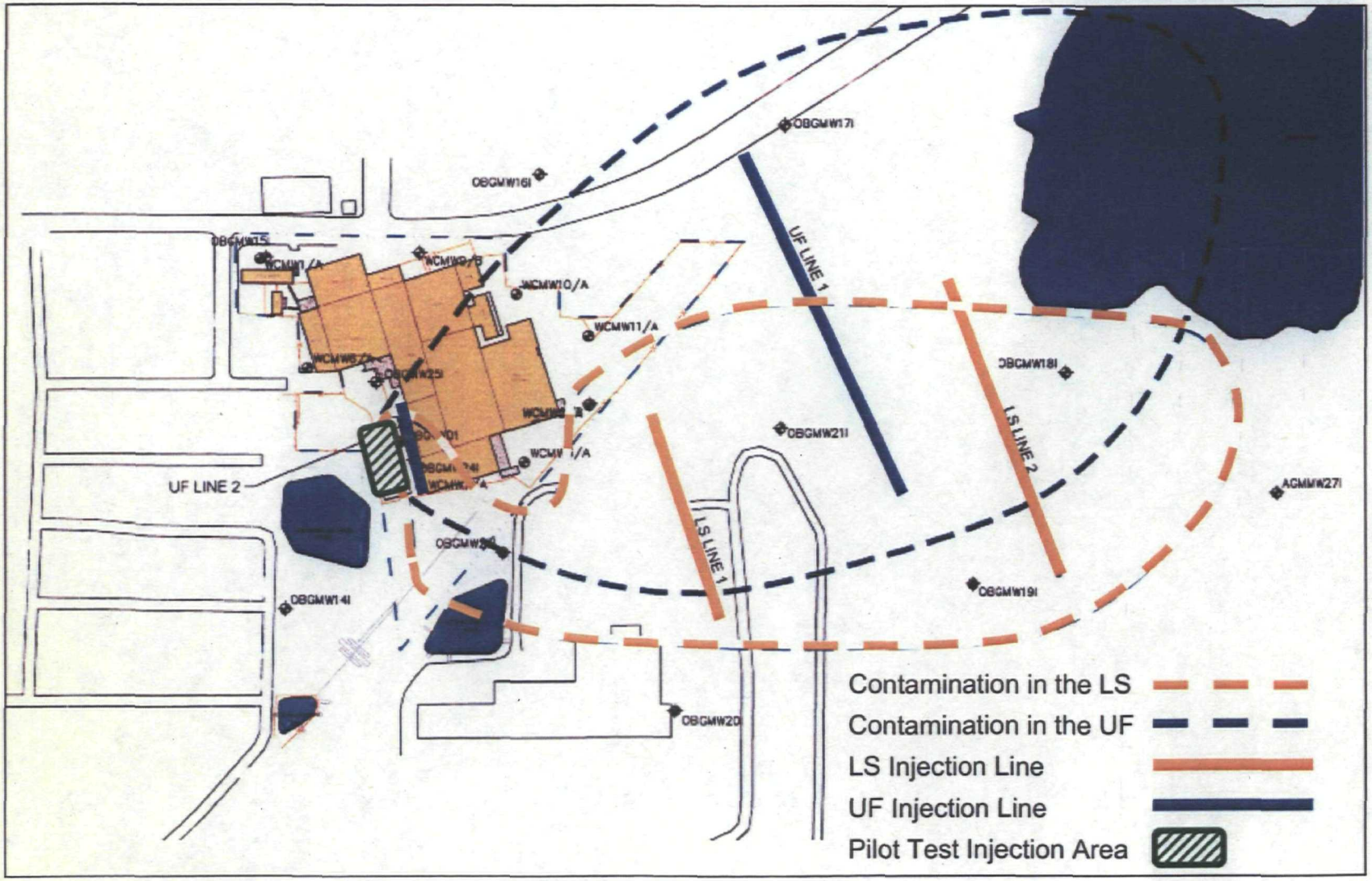
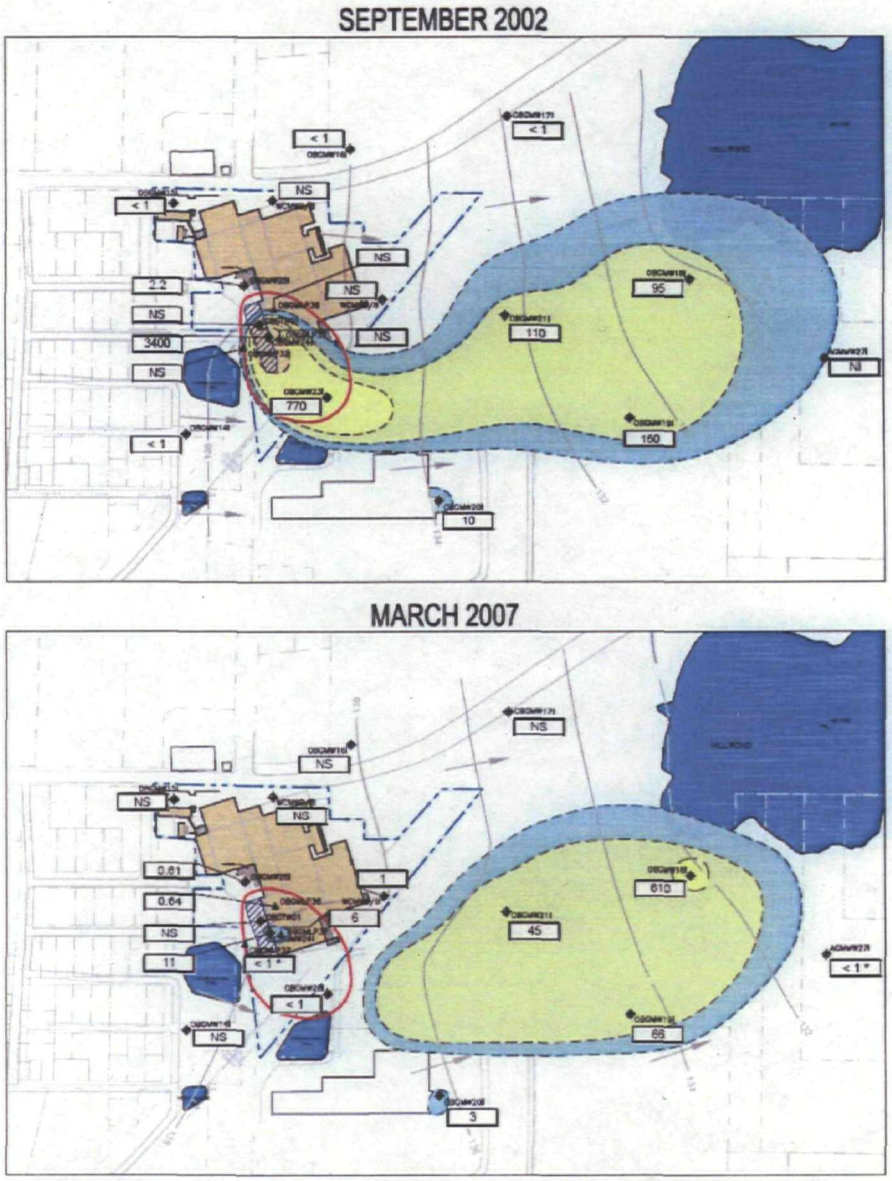


Figure 15. Groundwater Contamination before Pilot Test and after 28 months of Pilot Test



TABLES

Table 1. Chronology of Key Work and Reports.

Consultant	Report / Work Plan Date	Report / Work Plan Title
Wapora, Inc.	12/21/1984	Environmental Program Support
Wapora, Inc.	7/2/1985	Spill Report
Enviropact	8/20/1985	Testing of Floor Sweepings
R.A. Kirkner & Associates, Inc. on behalf of the Madison County Commission	May-86	Interim Guidelines for Screening of Solid Waste from ITT Thompson Industries Madison, Florida Facility
Environmental Technology Engineering, Inc.	Oct-86	Preliminary Contamination Assessment Plan, ITT Thompson, Madison, Florida
Environmental Technology Engineering, Inc.	Oct-86	Preliminary Contamination Assessment Plan (Revised), ITT Thompson, Madison, Florida
Bryson Industrial Services, Inc.	Aug-87	Preliminary Contamination Assessment Report, ITT Thompson, Madison, Florida
Bryson Industrial Services, Inc.	11/24/1987	Preliminary Contamination Assessment Report (Addendum) ITT-Thompson Madison, Florida
Bryson Industrial Services, Inc.	8/17/1988	Preliminary Contamination Assessment Report (Phase II) ITT-Thompson Madison, Florida
Bryson Industrial Services, Inc.	Apr-90	Preliminary Contamination Assessment Report (Phase III)Thompson International (Formerly - ITT Thompson) Madison Florida
Submitted by ITT Automotive. Consultant likely Woodward-Clyde	5/10/1995	Preliminary Contamination Assessment Plan
Woodward-Clyde Consultants	Oct-95	Preliminary Contamination Assessment Report Former ITT Thompson Facility Madison, Florida
FDEP	1996	Preliminary Assessment Report
Woodward-Clyde Consultants	May-96	Preliminary Contamination Assessment Report Addendum
Woodward-Clyde Consultants	7/9/1996	Letter Workplan, Additional Remedial Investigation
Woodward-Clyde Consultants	Oct-96	Contamination Assessment Report Addendum II, Former ITT/Thompson Facility, Madison, Florida
James McCarthy on behalf of Florida Department of Environmental Protection	1/7/1997 (revised from 9/10/96)	Preliminary Assessment Report, ITT Thompson Industries, Inc., Madison County, Florida
Woodward-Clyde Consultants	5/1/1997; 7/97	Preliminary Data Report, Volatile Halogenated and Aromatic Hydrocarbon Analysis of Soil and Water at the Former Thompson Facility, Madison, Florida
Ecology and Environment, Inc. on behalf of FDEP	6/1/1997	Draft Site Investigation Workplan
Woodward-Clyde Consultants	Jul-97	Direct-Push Investigation for Interim Remedial Alternative Assessment, Former ITT/Thompson Facility, Madison, Florida
Ecology and Environment, Inc. on behalf of FDEP	Oct-97	Site Investigation Report for the ITT Thompson Industries Site, Madison, Madison County, Florida
Woodward-Clyde Consultants	Aug-98	Interim Remedial Measures Workplan, Former ITT/Thompson Facility, Madison, Florida
O'Brien & Gere Engineers, Inc.	Dec-98	Interim Remedial Measures Workplan Addendum No. 1
O'Brien & Gere Engineers, Inc.	12/29/1998	Draft Workplan : Phase I Expanded Site Investigation and Remova Action, Former Thompson Industries Site, Madison, Florida
O'Brien & Gere, Engineers, Inc.	12/29/1998	Phase I ESI RA Draft Health and Safety Plan and Air Monitoring Plan
O'Brien & Gere, Engineers, Inc.	1/27/1999	Draft Workplan, Phase II Expanded Site Investigation/Remedial Investigation and Feasibility Study, Former Thompson Industries Site, Madison, Florida

Table 1. Chronology of Key Work and Reports (cont.)

Consultant	Report / Work Plan Date	Report / Work Plan Title
O'Brien & Gere, Engineers, Inc.	Jan-99	Draft SAP and FSP: Phase II Expanded Site Investigation/Remedial Investigation and Feasibility Study, Former Thompson Industries Site, Madison, Florida
O'Brien & Gere, Engineers, Inc.	Jan-99	Draft HASP: Phase II Expanded Site Investigation/Remedial Investigation and Feasibility Study, Former Thompson Industries Site, Madison, Florida
O'Brien & Gere, Engineers, Inc.	2/12/1999	Workplan - Revision I, Phase I Expanded Site Investigation, Removal Action, Former Thompson Industries Site, Madison, Florida
O'Brien & Gere, Engineers, Inc.	2/12/1999	Former Thompson Industries Site, Interim Remedial Measures Workplan Addendum No. 1 - Revision 1
O'Brien & Gere, Engineers, Inc.	7/15/1999	Final Work Plan, Combined Expanded Site Investigation/Remedial Investigation and Feasibility Study, Former Thompson Industries site, Madison, Florida
O'Brien & Gere, Engineers, Inc.	9/27/1999	Interim Technical Memorandum Site Geology Information Combined ESI/RI and FS Former Thompson Industries Site Madison, Florida
O'Brien & Gere, Engineers, Inc.	Sep-99	Interim Remedial Measures Conceptual Design, Former Thompso Industries Site, Madison, Florida
O'Brien & Gere, Engineers, Inc.	10/25/1999	Interim Technical Memorandum Soil Headspace Screening Program and Confirmation Soil Sampling Combined ESI/RI and FS Former Thompson Industries Site Madison, Florida
O'Brien & Gere, Engineers, Inc.	Oct-99	Interim Technical Memorandum Site Inspection Combined ESI/RI and FS Former Thompson Industries Site Madison, Florida
O'Brien & Gere, Engineers, Inc.	11/15/1999	Interim Technical Memorandum Shallow and Intermediate Zone Ground Water Assessment Combined ESI/RI and FS Former Thompson Industries Site Madison, Florida
O'Brien & Gere, Engineers, Inc.	1/12/2000	Interim Technical Memorandum Shallow and Intermediate Zone Ground Water Assessment Addendum Former Thompson Industries Site Madison, Florida
O'Brien & Gere, Engineers, Inc.	1/31/2000	Interim Remedial Action Pilot Test Results
O'Brien & Gere, Engineers, Inc.	Mar-00	Source Characterization Scope of Work, Former Thompson Industries Site, Madison Florida
O'Brien & Gere, Engineers, Inc.	6/30/2000	Final Technical Memorandum Shallow and Intermediate Zone Ground Water Assessment Combined ESI/RI and FS Former Thompson Industries Site Madison, Florida
O'Brien & Gere, Engineers, Inc.	3/9/2001	Interim Technical Memorandum Site Inspection Addendum Combined ESI/RI and FS Former Thompson Industries Site Madison, Florida
O'Brien & Gere, Engineers, Inc.	4/27/2001	Phase 2 Ground Water Investigation Technical Memorandum
O'Brien & Gere, Engineers, Inc.	4/9/2001	Semiannual Ground Water Monitoring Report (December 2000 and March 2001 Sampling Events) Former Thompson Industries Site Madison, Florida
O'Brien & Gere, Engineers, Inc.	Jul-01	Draft Preliminary Site Characterization Summary Report, Former Thompson Industries Site, Madison, Florida
O'Brien & Gere, Engineers, Inc.	Oct-01	Final Preliminary Site Characterization Summary Report, Former Thompson Industries Site, Madison, Florida
O'Brien & Gere, Engineers, Inc.	2/6/2002	Treatability Study Workplan
O'Brien & Gere, Engineers, Inc.	2/7/2002	Semiannual Ground Water Monitoring Report (June 2001 and September 2001 Sampling Events) Former Thompson Industries Site Madison, Florida

Table 1. Chronology of Key Work and Reports (cont.)

Consultant	Report / Work Plan Date	Report / Work Plan Title
O'Brien & Gere, Engineers, Inc.	Feb-02	Phase 3 Ground Water Investigation Technical Memorandum for the Combined ESI/RI and FS, Former Thompson Industries Site, Madison, Florida
O'Brien & Gere, Engineers, Inc. and Earth Tech, Inc.	8/22/2002	Semiannual Ground Water Monitoring Report (December 2001 and April 2002 Sampling Events) Former Thompson Industries Site Madison, Florida
O'Brien & Gere, Engineers, Inc.	Aug-02	Interim Technical Memorandum Addendum No. 2, Site Inspection
Earth Tech, Inc.	11/15/2002	Technical Memorandum Slug Test Results in Flow Zones 1, 2, and 3 and Status of Future Aquifer Performance Test.
Earth Tech, Inc.	12/12/02	Semi-annual Ground Water Monitoring Report (Sampling Event 7 June 2002 & Sampling Event 8 – September 2002)
Earth Tech, Inc.	Jul-03	Final Combined Expanded Site Investigation/Remedial Investigatio Report
Earth Tech, Inc.	8/27/2003	September 2003 Groundwater Monitoring – Sampling Event 9 Technical Memorandum
Earth Tech, Inc.	Jan-04	Annual 2003 Groundwater Monitoring Report (Sampling Event 9, September 2003)
ARCADIS	5/1/2004	Final ERD Pilot Test Work Plan
ARCADIS	4/9/2004	April 2004 Groundwater Monitoring – Sampling Event 10 Technica Memorandum
ARCADIS	Sept-05	Final Annual Ground Water Monitoring Report Sampling Event 10 – April 2004
ARCADIS	Oct-04	Final Gradient Study – Addendum to the ERD Pilot Test Work Plan
ARCADIS	10/29/2004	Work Plan to Conduct a Pilot Test for Sediment Toxicity Testing of the Unnamed Natural Pond (UNP)
ARCADIS	3/8/2005	March 2005 Groundwater Monitoring – Sampling Event 11 Technical Memorandum
ARCADIS	4/8/2005	DRAFT – Sediment Toxicity Testing of the Unnamed Natural Pond (UNP): Results and Recommendations
ARCADIS	4/8/2005	March 2005 Groundwater Monitoring – Sampling Event 11 Technical Memorandum
ARCADIS	Jul-05	Six-Month ERD Pilot Test Status Report
ARCADIS	Mar-05.	Final Annual Ground Water Monitoring Report Sampling Event 11 – March 2005
ARCADIS	7/28/2005	Work Plan to Conduct the Phase II Pilot Test for the Unnamed Natural Pond (UNP)
ARCADIS	11/3/2005	Phase II Pilot Test for the Unnamed Natural Pond (UNP): Results and Recommendations
ARCADIS	12/21/2005	March 2006 Groundwater Monitoring – Sampling Event 12 Technical Memorandum
ARCADIS	Feb-06	Twelve-Month ERD Pilot Test Status Report
ARCADIS	Jul-06	Final ERD Pilot Test Report
ARCADIS	Sept-06	Draft Annual Ground Water Monitoring Report Sampling Event 12 – February and March 2006

Table 2. Final Chemicals of Concern for Human Health.

Final COCs
Baseline Human Health Risk Assessment

Final COCs	Surface Soil		Subsurface Soil		Surface Water	Groundwater		
	Exposed	Exposed and Unexposed	Exposed	Exposed and Unexposed	Mill Pond	On-Site Surficial	Off-Site Surficial	Off-Site Floridan
Current Exposure Scenario								
VOCs								
Trichloroethene								X
Vinyl chloride (chloroethane)					X			X
Inorganics								
Arsenic	X							
Future Industrial Scenario								
VOCs								
Trichloroethene						X		
Vinyl chloride (chloroethane)						X		
Future Residential Scenario								
VOCs								
1,4-Dichlorobenzene						X		
Benzene						X	X	
cis-1,2-Dichloroethene						X	X	
Trichloroethene						X	X	X
Vinyl chloride (Chloroethene)				X	X	X	X	X
Inorganics								
Arsenic	X	X	X	X				

COC - Chemical of Concern
VOC - Volatile Organic Compound
X - Indicates chemical is designated as a COC for the exposure medium; blank space indicates the chemical is not a COC for the exposure medium.
No Final COCs were identified for Surface Water in the Unnamed Natural Pond; Fish Tissue in the Mill Pond;
or Sediment in the Unnamed Natural Pond or Mill Pond.

Table 3. Overall Summary of Risks and Hazards for COPCs.

Overall Summary of Risks and Hazards for COPCs

Receptor Exposure Medium	Carcinogenic Risk [1]	Noncarcinogenic Hazard Index [1]
Current Adolescent Trespasser		
Surface Soil — Exposed Surface Soil	1.8E-07	0.1
Current Adolescent Resident		
Surface Water — Unnamed Natural Pond	2.9E-07	0.03
Sediment — Unnamed Natural Pond	8.2E-07	0.5
Current Adult Resident		
Surface Soil — Exposed Surface Soil	6.8E-06	1
Surface Water — Mill Pond	6.2E-06	0.009
Surface Water — Fish from Mill Pond	7.9E-04	8
Sediment — Mill Pond	0.0E+00	0.03
Groundwater — Off-Site Floridan Aquifer	2.6E-03	26
Current Child Resident		
Surface Soil — Exposed Surface Soil	NA	4
Surface Water — Mill Pond	NA	0.03
Surface Water — Fish from Mill Pond	NA	13
Sediment — Mill Pond	NA	0.07
Groundwater — Off-Site Floridan Aquifer	NA	48
Future Industrial Worker		
Surface Soil — Exposed Surface Soil	1.1E-06	0.3
Surface Soil	1.8E-06	0.5
Subsurface Soil — Exposed Subsurface Soil	7.6E-07	0.3
Subsurface Soil	1.9E-06	0.2
Groundwater — On-Site Surficial Aquifer	5.6E-03	30
Future Adolescent Resident		
Surface Water — Unnamed Natural Pond	2.9E-07	0.03
Sediment — Unnamed Natural Pond	8.2E-07	0.5
Future Adult Resident		
Surface Soil — Exposed Surface Soil	6.8E-06	1
Surface Soil	9.4E-06	1
Subsurface Soil — Exposed Surface Soil	4.2E-06	0.8
Subsurface Soil	8.2E-06	0.6
Surface Water — Mill Pond	6.2E-06	0.009
Surface Water — Fish from Mill Pond	7.9E-04	8
Sediment — Mill Pond	0.0E+00	0.03
Groundwater — On-Site Surficial Aquifer	2.9E-02	109
Groundwater — Off-Site Surficial Aquifer	1.3E-02	69
Groundwater — Off-Site Floridan Aquifer	2.6E-03	26

Table 3. Overall Summary of Risks and Hazards for COPCs (cont)

Overall Summary of Risks and Hazards for COPCs

Receptor Exposure Medium	**Carcinogenic Risk** [1]	**Noncarcinogenic Hazard Index** [1]
Future Child Resident		
Surface Soil — Exposed Surface Soil	NA	4
Surface Soil	NA	4
Subsurface Soil — Exposed Surface Soil	NA	2
Subsurface Soil	NA	2
Surface Water — Mill Pond	NA	0.03
Surface Water — Fish from Mill Pond	NA	13
Sediment — Mill Pond	NA	0.07
Groundwater — On-Site Surficial Aquifer	NA	201
Groundwater — Off-Site Surficial Aquifer	NA	126
Groundwater — Off-Site Floridan Aquifer	NA	48

NA = Not Applicable
NC = No carcinogenic COPCs identified for that medium and intake routes.
[1] Risk values and hazard indices are taken from Tables 6-1 through 6-33. Risk and Hazard
calculation tables are located in Appendix D.

Table 4. Summary of the risks associated with the COCs

Receptor	Total Carcinogenic Risk							
COCs	Surface Soil		Subsurface Soil		Surface Water	Groundwater		
	Exposed	Exposed and Unexposed	Exposed	Exposed and Unexposed	Mill Pond	On-Site Surficial Aquifer	Off-Site Surficial Aquifer	Off-Site Floridan Aquifer
Current Adolescent Trespasser								
No COCs	—	—	—	—	—	—	—	—
Current Adolescent Resident								
No COCs	—	—	—	—	—	—	—	—
Current Adult Resident								
Trichloroethene	—	—	—	—	—	—	—	2.6E-03
Vinyl chloride (Chloroethane)	—	—	—	—	5.6E-06	—	—	5.1E-06
Arsenic	6.2E-06	—	—	—	—	—	—	—
Current Child Resident								
Trichloroethene	—	—	—	—	—	—	—	—
Future Industrial Worker								
Trichloroethene	—	—	—	—	—	1.1E-03	—	—
Vinyl chloride (Chloroethene)	—	—	—	—	—	4.5E-03	—	—
Future Adolescent Resident								
No COCs	—	—	—	—	—	—	—	—
Future Adult Resident								
1,4-Dichlorobenzene	—	—	—	—	—	3.0E-06	—	—
Benzene	—	—	—	—	—	5.7E-06	1.1E-06	—
cis-1,2-Dichloroethene	—	—	—	—	—	—	—	—
Trichloroethene	—	—	—	—	—	9.3E-03	6.3E-03	2.6E-03
Vinyl chloride (Chloroethene)	—	—	—	1.9E-06	5.6E-06	2.0E-02	6.6E-03	5.1E-06
Arsenic	6.2E-06	4.5E-06	3.6E-06	3.3E-06	—	—	—	—
Future Child Resident								
Benzene	—	—	—	—	—	—	—	—
cis-1,2-Dichloroethene	—	—	—	—	—	—	—	—
Trichloroethene	—	—	—	—	—	—	—	—
Vinyl chloride (Chloroethene)	—	—	—	—	—	—	—	—

Notes:

No Final COCs were identified for Surface Water in the Unnamed Natural Pond; Fish Tissue in the Mill Pond; or Sediment in the Unnamed Natural Pond or Mill Pond.

Table 4. Summary of the risks associated with the COCs (cont.)

Receptor / COCs	Total Non-Carcinogenic Hazard Index							
	Surface Soil		Subsurface Soil		Surface Water	Groundwater		
	Exposed	Exposed and Unexposed	Exposed	Exposed and Unexposed	Mill Pond	On-Site Surficial Aquifer	Off-Site Surficial Aquifer	Off-Site Floridan Aquifer
Current Adolescent Trespasser								
No COCs	—	—	—	—	—	—	—	—
Current Adolescent Resident								
No COCs	—	—	—	—	—	—	—	—
Current Adult Resident								
Trichloroethene	—	—	—	—	—	—	—	25
Vinyl chloride (Chloroethane)	—	—	—	—	—	—	—	—
Arsenic	—	—	—	—	—	—	—	—
Current Child Resident								
Trichloroethene	—	—	—	—	—	—	—	46
Future Industrial Worker								
Trichloroethene	—	—	—	—	—	25	—	—
Vinyl chloride (Chloroethene)	—	—	—	—	—	3	—	—
Future Adolescent Resident								
No COCs	—	—	—	—	—	—	—	—
Future Adult Resident								
1,4-Dichlorobenzene	—	—	—	—	—	—	—	—
Benzene	—	—	—	—	—	—	—	—
cis-1,2-Dichloroethene	—	—	—	—	—	3	2	—
Trichloroethene	—	—	—	—	—	90	61	25
Vinyl chloride (Chloroethene)	—	—	—	—	—	12	4	—
Arsenic	—	—	—	—	—	—	—	—
Future Child Resident								
Benzene	—	—	—	—	—	0.3	—	—
cis-1,2-Dichloroethene	—	—	—	—	—	5	3	—
Trichloroethene	—	—	—	—	—	166	113	46
Vinyl chloride (Chlorocthene)	—	—	—	—	—	22	7	—

Notes:
No Final COCs were identified for Surface Water in the Unnamed Natural Pond; Fish Tissue in the Mill Pond; or Sediment in the Unnamed Natural Pond or Mill Pond.

Table 5. Summary of Ecological Risks for Final COPECs

Final COPECs	HQ
Exposed Surface Soil (0 - 1 ft bls)	
No Final COPECs identified	—
Exposed and Unexposed Surface Soil (0 - 1 ft bls)	
No Final COPECs identified	—
Exposed Subsurface Soil (2 - 6 ft bls)	
No Final COPECs identified	—
Exposed and Unexposed Subsurface Soil (2 - 6 ft bls)	
No Final COPECs identified	—
Surface Water - Unnamed Natural Pond Area	
No Final COPECs identified	—
Surface Water - Mill Pond	
No Final COPECs identified	—
Sediment - Unnamed Natural Pond Area	
Chromium	11.1
Lead	2.29
Zinc	7.79
Sediment - Mill Pond	
No Final COPECs identified	—
Shallow/Intermediate Groundwater - Surficial Aquifer	
No Final COPECs identified	—

Notes:
[1] Based on Table 4-15 in the Combined Screening Level Ecological Risk Assessment.
ft bls - Feet below land surface
HQ - Hazard Quotient

Table 6. Summary of Analytical Results for Sediment in the Unnamed Natural Pond

Parameter	Units	AGM-SE-1	AGM-SE-2 [b]	AGM-SE-3	AGM-SE-4	AGM-SE-5
Sediment COPEC Data [a]						
Chromium	mg/kg	1,500	1,160 (620 & 1,700)	1,100	1,700	1,000
Lead	mg/kg	230	190 (110 & 270)	200	230	210
Zinc	mg/kg	1,800	1,600 (900 & 2,300)	2,000	1,800	2,100
Bis(2-ethylhexyl)phthalate	mg/kg	<1.7	1.35 (<1.3 & 1.4)	1.6	1.9	2.1
Sediment Physical Data						
Moisture	%	89.8	87 (87 & 86.6)	84.8	77.8	88.3
Total Organic Carbon	%	7.18	7.67 (7.77 & 7.57)	8.72	6.35	7.57
Sediment Pore Water Data						
Ammonia	mg/L	11.8	3.1 (3.0 & 3.2)	3.1	1.8	15.2
pH	SU	6.89	6.90 (6.91 & 6.88)	6.59	7.14	6.65

Footnotes:
Samples were collected with a Ponar grab sample and are representative of the top of the sediment (0-0.5 feet)

[a] Results reported on a dry-weight basis

[b] Average of values for the regular and duplicate samples, which are presented in that order in parentheses.

COPEC = Chemicals of potential ecological concern
mg/kg - Milligrams per kilogram
ug/kg = Micrograms per kilogram
BDL (<1,700) = below detection limit at quantity indicated in parenthesis
SU = standard unit
Samples collected on January 26, 2005

Table 7. Proposed Sediment Remediation Levels for Sediment in the Unnamed Natural Pond

COPEC	Proposed Remediation Level (mg/kg)
Chromium	1,000
Lead	190
Zinc	1600
bis(2-Ethylhexyl)phthalate	1.35

Notes:
COPEC = Contaminant of Potential Ecological Concern
mg/kg = milligram per kilogram

Table 8. Final Remedial Cleanup Goals for ITT Thompson Industries

Medium (units)	Contaminant of Concern	Cleanup Goal	Basis for Cleanup Goal
Groundwater (µg/L)	Benzene	1	FDEP GCTL/MCL [1]
	1,4-Dichlorobenzene	75	Federal MCL and FDEP GCTL/MCL [1]
	TCE	3	FDEP GCTL/MCL [1]
	1,2-cisDCE	70	Federal MCL and FDEP GCTL/MCL [1]
	Vinyl Chloride	1	FDEP GCTL/MCL [1]
Surface water (µg/L)	Vinyl Chloride	2.4	EPA NRWQC and FDEP Freshwater Surface Water Criteria [1]
Sediment (mg/kg)	Chromium	1,000	Site-specific, toxicity-based clean up level for ecological protection
	Lead	190	Site-specific, toxicity-based clean up level for ecological protection
	Zinc	1,600	Site-specific, toxicity-based clean up level for ecological protection
	Bis (2-ethylhexyl) phthalate	1.35	Site-specific, toxicity-based clean up level for ecological protection
Surface and Subsurface Soil (mg/kg) (	Arsenic	12	FDEP SCTL Industrial [2]
		2.1	FDEP SCTL Residential [2]
	Vinyl Chloride	0.8	FDEP SCTL Industrial [2]
		0.2	FDEP SCTL Residential [2]

Notes:
µg/L micrograms per liter
mg/kg milligrams per kilogram
FDEP Florida Department of Environmental Proteciton
GCTL Groundwater Cleanup Target Leves
HQ Hazard Quotient
MCL Maximum Contaminant Level
[1] Remedial Goals include Relevant and Appropriate criteria specified by Florida Administrative Code (F.A.C.) Chapters 62-777 and 62-550
[2] Remedial Goals will be based on the planned land use and available land use restrictions
National Recommended Water Quality Criteria based on consumption of aquatic organisms.
Sediment cleanup goal is for ecological risk.

Table 9. Summary of Comparative Analysis - Soil Alternatives

Criteria	Alternative 1 No Further Action	Alternative 3 ICs, Excavation of Soil from S1 and SS1, Off-site Disposal, Backfill with Clean Fill
THRESHOLD CRITERIA		
Overall Protection of Human Health and the Environment	0	5
Compliance with ARARs	0	5
BALANCING CRITERIA		
Long-Term Effectiveness and Permanence	0	5
Reduction of Mobility, Toxicity, or Volume through Treatment	0	5
Short-Term Effectiveness	0	5
Implementability	5	5
COST		
Capital Cost	$0	$12,000
Short-Term O & M Cost	$0	$93,000
Long-Term O & M Cost	$0	$0
Total Project Cost	$0	$105,000
Total Present Worth Cost	$0	$105,000

Table 10. Summary of Comparative Analysis - Groundwater Alternatives

Criteria	Alternative 1 No Further Action	Alternative 2 Monitored Natural Attenuation	Alternative 4A Groundwater Extraction in Suspected Source Area, Ex-Situ Groundwater Treatment, and Discharge of Treated Groundwater to the POTW	Alternative 4B Groundwater Extraction in Suspected Source Area, Ex-Situ Groundwater Treatment, and Deep Well Reinjection of Treated Groundwater	Alternative 6 Offsite and Facility In-situ Enhanced Reductive Dechlorination, with Monitored Natural Attenuation
THRESHOLD CRITERIA					
Overall Protection of Human Health and the Environment	0	4	5	5	5
Compliance with ARARs	0	4	5	5	5
BALANCING CRITERIA					
Long-Term Effectiveness and Permanence	0	4	5	5	5
Reduction of Mobility, Toxicity, or Volume through Treatment	0	3	4	4	4
Short-Term Effectiveness	0	3	3	3	5
Implementability	5	5	4	3	4
COST					
Capital Cost	$0	$12,000	$690,000	$1,054,000	$478,000
Short-Term O & M Cost		$0	$0	$0	$828,000
Long-Term O & M Cost	$0	$1,498,000	$6,822,000	$5,668,000	$946,000
Total Project Cost	$0	$1,510,000	$7,512,000	$6,722,000	$2,252,000
Total Present Worth Cost	$0	$721,000	$4,997,000	$4,604,000	$1,920,000

Table 11. Estimated Costs for Ground Water Alternative 6 and Soil & Sediment Alternative 3

Ground Water Alternative 6	**Total Cost**	**Present Worth**
Site Maintenance	$134,000	$99,777
Institutional Controls/Deed Restrictions	$12,000	$12,000
Enhanced Reductive Dechlorination Capital Costs	$466,000	$466,000
Operation and Maintenance	828,000	735,892
Process and Annual Monitoring	812,160	606,416
Total Estimated Project Cost	**$2,252,000**	**$1,920,000**
Soil and Sediment Alternative 3	**Unit Cost**	**Present Worth**
Permitting		$10,000
Planning		$10,000
Mobilization		$5,000
Site Prep		$9,200
Pond Dewatering		$19,100
Tree trimming along pond edge		$7,000
Mix admixture into sediments for dewatering/handling		$19,500
Admixture - 10% Flyash		$20,000
Stockpile dewatered sediments		$13,000
Load sediments into truck		$6,500
Transportation of sediments		$13,000
Disposal of sediments		$39,000
Placement of six-inch soil layer		$16,000
Site restoration		$5,000
Demobilization		$5,000
Construction Oversight		$15,000
Project Management		$15,000
Subtotal		$227,300
Contingency (10%)		$22,730
Total Project		**$250,000**
Institutional Controls/Deed Restrictions		$12,000
Soil Remediation Costs (Excavation)		$93,360
Total Estimated Project Cost		**$105,000**
Total Estimated Project Cost		**$2,275,000**

Table 12. Chemical-Specific ARARs, Criteria, and Guidance

Requirement	Citation	Status	Synopsis	Evaluation/Action To Be Taken
Chemical Specific ARARs				
FEDERAL				
Clean Air Act	40 CFR 50.4 to 50.12	Applicable	NAAQS specify the maximum concentration of each criteria pollutant (carbon monoxide, lead, nitrogen dioxide, particulate matter, ozone, sulfur dioxide) which is to be permitted in the ambient air, as averaged over a period of time. Requirements differ for new sources of air pollutant emissions and existing sources. Requirements also differ based on the air quality designation of the site's location (i.e., attainment, non-attainment, unclassified, or transport) (see Federal Location Specific ARARs)	Emissions of criteria pollutants during the response action, or during the operations and maintenance of the response action. NAAQS are not enforceable in and of themselves. Any substantive standards contained within the State Implementation Plan are, however, federally enforceable.
Clean Air Act	40 CFR 63 Subpart GGGGG, NESHAPS for Site Remediation	Relevant and Appropriate	Site remediation is required to control emissions of organic HAP by meeting emissions limitations and work practice standards reflecting the application of maximum achievable control technology. Period inspections of equipment and continuous monitoring are required for the life of the remediation.	Emissions of hazardous air pollutants from site remediation
National Primary and Secondary Ambient Air Quality Standards	40 CFR Part 50	Applicable	Establishes standards for ambient air quality to protect public health and welfare. May be relevant or appropriate if remedial alternatives result in air	

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Table 12. Chemical-Specific ARARs, Criteria, and Guidance

Requirement	Citation	Status	Synopsis	Evaluation/Action To Be Taken
			emissions that migrate offsite.	
National Emissions Standards for Hazardous Air Pollutants (NESHAPS)	40 CFR Part 61	Applicable	Provides emissions standards for hazardous air pollutants for which no ambient air quality standard exists. May be relevant or appropriate if onsite treatment units with emissions are part of remedial actions	
STATE				
Florida Groundwater Classes, Standards, and Exemptions	Florida Administrative Code (FAC) Chapter 62.520	Applicable	This rule designates the groundwater of the State into five classes and establishes minimum "free from" criteria. This rule also specifies that Classes I and II must meet the primary and secondary drinking water standards listed in Chapter 62-550.	This rule was used to classify groundwater and establish cleanup goals for groundwater. Groundwater at this site is considered a potential source of drinking water (Class II).
Florida Drinking Water Standards, Monitoring, and Reporting	Chapter 62-550.310, FAC	Relevant and Appropriate	This rule provides primary drinking water quality standards and maximum contaminant levels (MCLs) for public water supply systems.	Cleanup goals for contaminants of concern in groundwater are based on Florida MCLs listed in this report.
Florida Contaminant Cleanup Target Levels Rule	Chapter 62-777.170(1)(a), FAC	Relevant and Appropriate	Establishes cleanup target levels for site rehabilitation pursuant to FAC Chapters 62-785, 62-730, 62-780, 62-770, 62-782, and 62-713.	CTLs for groundwater provided in Table 1 of this rule were used to establish cleanup goals.
Risk-based Cleanup Levels	Chapter 62-750.650(1)(d)	Relevant and Appropriate	In establishing this alternative site-specific CTLs for groundwater or soil the following factors shall be considered: 10-6 and HI	10-6 and/or HI considered in developing risk base cleanup level.

Table 13. Action-Specific ARARs, Criteria, and Guidance

Requirement	Citation	Status	Synopsis	Evaluation/Action To Be Taken
Florida Groundwater Classification	Chapter 62-520, FAC	Applicable	State classification system to establish groundwater usage categories for aquifers as part of a groundwater protection strategy. The surficial aquifer beneath the site carries a state classification of G-1. This classification means that the surficial aquifer is a sole-source aquifer that is an irreplaceable groundwater resource and warrants a high degree of protection.	
Florida Underground Injection Control Regulations	Chapter 62-528.600 through 528.645, FAC	Applicable	Establishes standards and criteria for construction, operation, monitoring, plugging, and abandonment for Class V wells	Regulations pertaining to Class V Group 4 injection wells associated with aquifer remediation projects will be followed
Florida Groundwater Permitting and Monitoring Requirements	Chapter 62-522.300 and 522.300(2)(e), FAC	Applicable	Establishes permitting and monitoring requirements for installations discharging to groundwater to prevent contaminants from causing a violation of water quality standards and criteria of the receiving groundwater.	A zone of discharge is allowed for primary standards for groundwater for closed-loop reinjection systems and for the prime constituents of the reagents used to remediate the contaminants
Florida Water Well Permitting and Construction Requirements	Chapter 62-532.500, FAC	Applicable	Establishes minimum standards for the location, construction, repair, and abandonment of water wells.	The requirements for permitting for the construction, repair and abandonment of monitoring, extraction, and injection wells will be met.
Florida Hazardous Waste – Requirements for Remedial Action	Chapter 62-730.225(3), FAC	Applicable	Requires warning signs at sites suspected or confirmed to be contaminated with hazardous waste.	This requirement will be met.

Table 13. Action-Specific ARARs, Criteria, and Guidance

Requirement	Citation	Status	Synopsis	Evaluation/Action To Be Taken
Florida Natural Attenuation with Monitoring Regulation	Chapter 62-780.690(8)(a) through (c), FAC	Relevant and Appropriate	Specifies minimum number of wells and sampling frequency for conducting groundwater monitoring as part of a natural attenuation remedy.	The requirements associated with implementation of groundwater monitoring will be met.
Florida Active Remediation Regulation for Groundwater in-Situ Systems(s)	Chapter 62-780.700(12)(g), FAC	Relevant and Appropriate	Specifies that operations parameters for in-situ system(s) should include measurements of biological, chemical, or physical indicators that will verify the radius of influence at representative monitoring locations, weekly for the first month, monthly for the next 2 months, quarterly for the first 2 years, and semi-annually thereafter.	In-situ groundwater remediation will meet the relevant requirements of this rule
Florida Active Remediation Regulation for Groundwater Bioremediation System(s)	Chapter 62-780.750(4)(a) through (c), FAC	Relevant and Appropriate	Specifies that operational parameters for bioremediation system(s) should include measurements of dissolved oxygen at representative monitoring locations; rates of biological, chemical, or nutrient enhancement additions; weekly for the first month, monthly for the next 2 months, quarterly for the first 2 years, and semi-annually thereafter.	Bioremediation groundwater remediation will meet relevant requirements of this rule.
Florida Post Active Remediation Monitoring Regulation	Chapter 62-780.750(4)(a) through (c), FAC	Relevant and Appropriate	Specifies minimum number of wells and sampling frequency for conducting groundwater monitoring as part of post active remediation monitoring	Post active remediation monitoring will meet the relevant requirements of this rule.

Table 14. Location-Specific ARARs, Criteria, and Guidance

Requirement	Citation	Status	Synopsis	Evaluation/Action To Be Taken
LOCATION SPECIFIC ARARs				
None Identified				

Table 4-1
Selection of Exposure Pathways[1]
Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report
Baseline Human Health Risk Assessment
Former Thompson Industries Site
Madison, Florida

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	On-Site/ Off-Site[2]	Type of Analysis[3]	Rationale for Selection or Exclusion of Exposure Pathway
Current	Surface Soil[4]	Surface Soil	Surface Soil	Trespasser	Adolescent	Ingestion	On-Site	Quant	Direct contact with exposed HHRA study area surface soil situated to the south and west of the Site.
						Dermal	On-Site	Quant	Direct contact with exposed HHRA study area surface soil situated to the south and west of the Site.
				Resident	Adult	Ingestion	On-Site	Quant	Direct contact with exposed HHRA study area surface soil situated in residential area west of the Site.
						Dermal	On-Site	Quant	Direct contact with exposed HHRA study area surface soil situated in residential area west of the Site.
					Child	Ingestion	On-Site	Quant	Direct contact with exposed HHRA study area surface soil situated in residential area west of the Site.
						Dermal	On-Site	Quant	Direct contact with exposed HHRA study area surface soil situated in residential area west of the Site.
		Air	Vapors from Volatilization	Trespasser	Adolescent	Inhalation	On-Site	Quant	Exposure to volatiles in exposed HHRA study area surface soil situated to the south and west of the Site.
				Resident	Adult	Inhalation	On-Site	Quant	Exposure to volatiles in exposed HHRA study area surface soil situated in the residential area west of the Site.
					Child	Inhalation	On-Site	Quant	Exposure to volatiles in exposed HHRA study area surface soil situated in the residential area west of the Site.
			Fugitive Dust	Trespasser	Adolescent	Inhalation	On-Site	Quant	Exposure to airborne particulates in exposed HHRA study area surface soil situated to the south and west of the Site.
				Resident	Adult	Inhalation	On-Site	Quant	Exposure to airborne particulates in exposed HHRA study area surface soil situated in the residential area west of the Site.
					Child	Inhalation	On-Site	Quant	Exposure to airborne particulates in exposed HHRA study area surface soil situated in the residential area west of the Site.
	Surface Water	Surface Water - Unnamed Natural Pond Area	Surface Water - Unnamed Natural Pond Area	Resident	Adolescent	Ingestion	On-Site	Quant	Direct contact with HHRA study area surface water from the pond area during wading activities.
						Dermal	On-Site	Quant	Direct contact with HHRA study area surface water from the pond area during wading activities.
			Fish Tissue - Unnamed Natural Pond Area	Resident	Adolescent	Ingestion	On-Site	None	Fishing activities are not associated with the pond area since there are no game fish for human consumption.
		Surface Water - Mill Pond	Surface Water - Mill Pond	Resident	Adult	Ingestion	On-Site	Quant	Direct contact with HHRA study area surface water from pond during recreational activities such as fishing.
						Dermal	On-Site	Quant	Direct contact with HHRA study area surface water from pond during recreational activities such as fishing.
					Child	Ingestion	On-Site	Quant	Direct contact with HHRA study area surface water from pond during recreational activities such as fishing.
						Dermal	On-Site	Quant	Direct contact with HHRA study area surface water from pond during recreational activities such as fishing.
			Fish Tissue - Mill Pond	Resident	Adult	Ingestion	On-Site	Quant	Exposure to HHRA study area surface water from Mill Pond via human consumption of game fish in the pond.
					Child	Ingestion	On-Site	Quant	Exposure to HHRA study area surface water from Mill Pond via human consumption of game fish in the pond.
	Sediment	Sediment - Unnamed Natural Pond Area	Sediment - Unnamed Natural Pond Area	Resident	Adolescent	Ingestion	On-Site	Quant	Direct contact with HHRA study area sediment from the pond area during wading activities.
						Dermal	On-Site	Quant	Direct contact with HHRA study area sediment from the pond area during wading activities.
		Sediment - Mill Pond	Sediment - Mill Pond	Resident	Adult	Ingestion	On-Site	Quant	Direct contact with HHRA study area sediment from pond during recreational activities such as fishing.
						Dermal	On-Site	Quant	Direct contact with HHRA study area sediment from pond during recreational activities such as fishing.
					Child	Ingestion	On-Site	Quant	Direct contact with HHRA study area sediment from pond during recreational activities such as fishing.
						Dermal	On-Site	Quant	Direct contact with HHRA study area sediment from pond during recreational activities such as fishing.
	Groundwater	Groundwater	On-Site Surficial Aquifer	Resident	Adult	Ingestion	On-Site	None	No direct contact since Surficial aquifer is not used as a source of potable water in the HHRA study area.
						Dermal	On-Site	None	No direct contact since Surficial aquifer is not used as a source of potable water in the HHRA study area.
					Child	Ingestion	On-Site	None	No direct contact since Surficial aquifer is not used as a source of potable water in the HHRA study area.
						Dermal	On-Site	None	No direct contact since Surficial aquifer is not used as a source of potable water in the HHRA study area.
		Air	On-Site Surficial Aquifer - Water Vapors	Resident	Adult	Inhalation	On-Site	None	No direct contact since Surficial aquifer is not used as a source of potable water in the HHRA study area.
					Child	Inhalation	On-Site	None	No direct contact since Surficial aquifer is not used as a source of potable water in the HHRA study area.
		Groundwater	Off-Site Surficial Aquifer	Resident	Adult	Ingestion	On-Site	None	No direct contact since Surficial aquifer is not used as a source of potable water in the HHRA study area.
						Dermal	On-Site	None	No direct contact since Surficial aquifer is not used as a source of potable water in the HHRA study area.
					Child	Ingestion	On-Site	None	No direct contact since Surficial aquifer is not used as a source of potable water in the HHRA study area.
						Dermal	On-Site	None	No direct contact since Surficial aquifer is not used as a source of potable water in the HHRA study area.
		Air	Off-Site Surficial Aquifer - Water Vapors	Resident	Adult	Inhalation	On-Site	None	No direct contact since Surficial aquifer is not used as a source of potable water in the HHRA study area.
					Child	Inhalation	On-Site	None	No direct contact since Surficial aquifer is not used as a source of potable water in the HHRA study area.
		Groundwater	Off-Site Floridan Aquifer	Resident	Adult	Ingestion	On-Site	Quant	Direct contact with groundwater from Floridan well; upper Floridan aquifer is a potential source of potable water in the HHRA study area.
						Dermal	On-Site	Quant	Direct contact with groundwater from Floridan well; upper Floridan aquifer is a potential source of potable water in the HHRA study area.
					Child	Ingestion	On-Site	Quant	Direct contact with groundwater from Floridan well; upper Floridan aquifer is a potential source of potable water in the HHRA study area.
						Dermal	On-Site	Quant	Direct contact with groundwater from Floridan well; upper Floridan aquifer is a potential source of potable water in the HHRA study area.
		Air	Off-Site Floridan Aquifer - Water Vapors	Resident	Adult	Inhalation	On-Site	Quant	Exposure to volatiles in groundwater from Floridan well; upper Floridan aquifer is a potential source of potable water in the HHRA study area.
					Child	Inhalation	On-Site	Quant	Exposure to volatiles in groundwater from Floridan well; upper Floridan aquifer is a potential source of potable water in the HHRA study area.

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Table 4-1
Selection of Exposure Pathways[1]
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Madison, Florida

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	On-Site/ Off-Site[2]	Type of Analysis[3]	Rationale for Selection or Exclusion of Exposure Pathway
Future	Surface Soil[4]	Surface Soil	Surface Soil	Industrial Worker	Adult	Ingestion	On-Site	Quant	Direct contact with HHRA study area surface soil while working outside.
						Dermal	On-Site	Quant	Direct contact with HHRA study area surface soil while working outside.
				Resident	Adult	Ingestion	On-Site	Quant	Direct contact with all HHRA study area surface soil while outside at home.
						Dermal	On-Site	Quant	Direct contact with all HHRA study area surface soil while outside at home.
					Child	Ingestion	On-Site	Quant	Direct contact with all HHRA study area surface soil while playing outside at home.
						Dermal	On-Site	Quant	Direct contact with all HHRA study area surface soil while playing outside at home.
		Air	Vapors from Volatilization	Industrial Worker	Adult	Inhalation	On-Site	Quant	Exposure to volatiles in HHRA study area surface soil while working outside.
				Resident	Adult	Inhalation	On-Site	Quant	Exposure to volatiles in HHRA study area surface soil while outside at home.
					Child	Inhalation	On-Site	Quant	Exposure to volatiles in HHRA study area surface soil while playing outside at home.
			Fugitive Dust	Industrial Worker	Adult	Inhalation	On-Site	Quant	Exposure to airborne particulates in HHRA study area surface soil while working outside.
				Resident	Adult	Inhalation	On-Site	Quant	Exposure to airborne particulates in HHRA study area surface soil while outside at home.
					Child	Inhalation	On-Site	Quant	Exposure to airborne particulates in HHRA study area surface soil while playing outside at home.
	Subsurface Soil[4]	Subsurface Soil	Subsurface Soil	Industrial Worker	Adult	Ingestion	On-Site	Quant	Direct contact with HHRA study area subsurface soil while working outside.
						Dermal	On-Site	Quant	Direct contact with HHRA study area subsurface soil while working outside.
				Resident	Adult	Ingestion	On-Site	Quant	Direct contact with all HHRA study area subsurface soil while outside at home.
						Dermal	On-Site	Quant	Direct contact with all HHRA study area subsurface soil while outside at home.
					Child	Ingestion	On-Site	Quant	Direct contact with all HHRA study area subsurface soil while playing outside at home.
						Dermal	On-Site	Quant	Direct contact with all HHRA study area subsurface soil while playing outside at home.
		Air	Vapors from Volatilization	Industrial Worker	Adult	Inhalation	On-Site	Quant	Exposure to volatiles in HHRA study area subsurface soil while working outside.
				Resident	Adult	Inhalation	On-Site	Quant	Exposure to volatiles in HHRA study area subsurface soil while outside at home.
					Child	Inhalation	On-Site	Quant	Exposure to volatiles in HHRA study area subsurface soil while playing outside at home.
			Fugitive Dust	Industrial Worker	Adult	Inhalation	On-Site	Quant	Exposure to airborne particulates in HHRA study area subsurface soil while working outside.
				Resident	Adult	Inhalation	On-Site	Quant	Exposure to airborne particulates in HHRA study area subsurface soil while outside at home.
					Child	Inhalation	On-Site	Quant	Exposure to airborne particulates in HHRA study area subsurface soil while playing outside at home.
	Surface Water	Surface Water - Unnamed Natural Pond Area	Surface Water - Unnamed Natural Pond Area	Resident	Adolescent	Ingestion	On-Site	Quant	Direct contact with HHRA study area surface water from the pond area during wading activities.
						Dermal	On-Site	Quant	Direct contact with HHRA study area surface water from the pond area during wading activities.
			Fish Tissue - Unnamed Natural Pond Area	Resident	Adolescent	Ingestion	On-Site	None	Fishing activities are not associated with the pond area since there are no game fish for human consumption.
		Surface Water - Mill Pond	Surface Water - Mill Pond	Resident	Adult	Ingestion	On-Site	Quant	Direct contact with HHRA study area surface water from pond during recreational activities such as fishing.
						Dermal	On-Site	Quant	Direct contact with HHRA study area surface water from pond during recreational activities such as fishing.
					Child	Ingestion	On-Site	Quant	Direct contact with HHRA study area surface water from pond during recreational activities such as fishing.
						Dermal	On-Site	Quant	Direct contact with HHRA study area surface water from pond during recreational activities such as fishing.
			Fish Tissue - Mill Pond	Resident	Adult	Ingestion	On-Site	Quant	Exposure to HHRA study area surface water from Mill Pond via human consumption of game fish in the pond.
					Child	Ingestion	On-Site	Quant	Exposure to HHRA study area surface water from Mill Pond via human consumption of game fish in the pond

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Table 4-1
Selection of Exposure Pathways[1]
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Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	On-Site/ Off-Site[2]	Type of Analysis[3]	Rationale for Selection or Exclusion of Exposure Pathway
Future (cont.)	Sediment	Sediment - Unnamed Natural Pond Area	Sediment - Unnamed Natural Pond Area	Resident	Adolescent	Ingestion	On-Site	Quant	Direct contact with HHRA study area sediment from the pond area during wading activities.
						Dermal	On-Site	Quant	Direct contact with HHRA study area sediment from the pond area during wading activities.
		Sediment - Mill Pond	Sediment - Mill Pond	Resident	Adult	Ingestion	On-Site	Quant	Direct contact with HHRA study area sediment from pond during recreational activities such as fishing.
						Dermal	On-Site	Quant	Direct contact with HHRA study area sediment from pond during recreational activities such as fishing.
					Child	Ingestion	On-Site	Quant	Direct contact with HHRA study area sediment from pond during recreational activities such as fishing.
						Dermal	On-Site	Quant	Direct contact with HHRA study area sediment from pond during recreational activities such as fishing.
	Groundwater	Groundwater	On-Site Surficial Aquifer	Industrial Worker	Adult	Ingestion	On-Site	Quant	Direct contact with groundwater from Surficial well; Surficial aquifer is assumed to be a potential source of potable water in the HHRA study area.
						Dermal	On-Site	Quant	Direct contact with groundwater from Surficial well; Surficial aquifer is assumed to be a potential source of potable water in the HHRA study area.
				Resident	Adult	Ingestion	On-Site	Quant	Direct contact with groundwater from Surficial well; Surficial aquifer is assumed to be a potential source of potable water in the HHRA study area.
						Dermal	On-Site	Quant	Direct contact with groundwater from Surficial well; Surficial aquifer is assumed to be a potential source of potable water in the HHRA study area.
					Child	Ingestion	On-Site	Quant	Direct contact with groundwater from Surficial well; Surficial aquifer is assumed to be a potential source of potable water in the HHRA study area.
						Dermal	On-Site	Quant	Direct contact with groundwater from Surficial well; Surficial aquifer is assumed to be a potential source of potable water in the HHRA study area.
		Air	On-Site Surficial Aquifer - Water Vapors	Industrial Worker	Adult	Inhalation	On-Site	None	Industrial worker is not expected to shower at the HHRA study area.
				Resident	Adult	Inhalation	On-Site	Quant	Exposure to volatiles in groundwater from Surficial well while showering; Surficial aquifer is assumed to be a potential source of potable water in the HHRA study area.
					Child	Inhalation	On-Site	Quant	Exposure to volatiles in groundwater from Surficial well while showering; Surficial aquifer is assumed to be a potential source of potable water in the HHRA study area.
		Groundwater	Off-Site Surficial Aquifer	Industrial Worker	Adult	Ingestion	On-Site	None	Industrial worker does not come in contact with groundwater from off-site Surficial wells (off-site land use is assumed to be residential).
						Dermal	On-Site	None	Industrial worker does not come in contact with groundwater from off-site Surficial wells (off-site land use is assumed to be residential).
				Resident	Adult	Ingestion	On-Site	Quant	Direct contact with groundwater from Surficial well; Surficial aquifer is assumed to be a potential source of potable water in the HHRA study area.
						Dermal	On-Site	Quant	Direct contact with groundwater from Surficial well; Surficial aquifer is assumed to be a potential source of potable water in the HHRA study area.
					Child	Ingestion	On-Site	Quant	Direct contact with groundwater from Surficial well; Surficial aquifer is assumed to be a potential source of potable water in the HHRA study area.
						Dermal	On-Site	Quant	Direct contact with groundwater from Surficial well; Surficial aquifer is assumed to be a potential source of potable water in the HHRA study area.
		Air	Off-Site Surficial Aquifer - Water Vapors	Industrial Worker	Adult	Inhalation	On-Site	None	Industrial worker does not come in contact with groundwater from off-site Surficial wells (off-site land use is assumed to be residential).
				Resident	Adult	Inhalation	On-Site	Quant	Exposure to volatiles in groundwater from Surficial well while showering; Surficial aquifer is assumed to be a potential source of potable water in the HHRA study area.
					Child	Inhalation	On-Site	Quant	Exposure to volatiles in groundwater from Surficial well while showering; Surficial aquifer is assumed to be a potential source of potable water in the HHRA study area.
		Groundwater	Off-Site Floridan Aquifer	Industrial Worker	Adult	Ingestion	On-Site	None	Industrial worker does not come in contact with groundwater from off-site Floridan wells (off-site land use is assumed to be residential).
						Dermal	On-Site	None	Industrial worker does not come in contact with groundwater from off-site Floridan wells (off-site land use is assumed to be residential).
				Resident	Adult	Ingestion	On-Site	Quant	Direct contact with groundwater from Floridan well; upper Floridan aquifer is a potential source of potable water in the HHRA study area.
						Dermal	On-Site	Quant	Direct contact with groundwater from Floridan well; upper Floridan aquifer is a potential source of potable water in the HHRA study area.
					Child	Ingestion	On-Site	Quant	Direct contact with groundwater from Floridan well; upper Floridan aquifer is a potential source of potable water in the HHRA study area.
						Dermal	On-Site	Quant	Direct contact with groundwater from Floridan well; upper Floridan aquifer is a potential source of potable water in the HHRA study area.
		Air	Off-Site Floridan Aquifer - Water Vapors	Industrial Worker	Adult	Inhalation	On-Site	None	Industrial worker does not come in contact with groundwater from off-site Floridan wells (off-site land use is assumed to be residential).
				Resident	Adult	Inhalation	On-Site	Quant	Exposure to volatiles in groundwater from Floridan well while showering; upper Floridan aquifer is a potential source of potable water in the HHRA study area.
					Child	Inhalation	On-Site	Quant	Exposure to volatiles in groundwater from Floridan well while showering; upper Floridan aquifer is a potential source of potable water in the HHRA study an

[1] Potential human receptors under current and reasonably anticipated future land use scenarios associated with the HHRA study area.
[2] On-site represents area associated with the HHRA study area.
[3] Principal potentially complete pathway to be quantitatively evaluated in the HHRA, assuming that human health COPCs are identified in the specific exposure group.
[4] Under the current land use scenario, surface soil represents exposed HHRA study area surface soil from 0 to 1 ft bls (i.e., assumes that soils below pavement will not be addressed under this scenario).
[5] Under the potential future land use scenario, surface soil represents HHRA study area soils from 0 to 1 ft bls, and subsurface soil represents HHRA study area surface and subsurface soils from 0 to 4 ft bls (i.e., assumes mixed soils based upon potential excavation scenario). Both exposed soils and soils below pavement will be addressed under this scenario.

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Table 4-2

Medium-Specific Exposure Point Concentration Summary — Surface Soil (0-1 ft bls) — Exposed Soil Only

Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report

Baseline Human Health Risk Assessment

Former Thompson Industries Site

Madison, Florida

Scenario Timeframe:	Current/Future
Medium:	Surface Soil
Exposure Medium:	Surface Soil
Exposure Point:	Exposed Surface Soil

Chemical of Potential Concern	Units	Arithmetic Mean (1)	95% UCL (2) of Normal Data	Maximum Detected Concentration	Maximum Qualifier	Maximum DV Code	EPC Units	Reasonable Maximum Exposure			Central Tendency		
								Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale	Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale
VOCs													
Naphthalene	mg/kg	2.91E+00	9.31E+01	2.00E+01	--	--	mg/kg	2.00E+01	Max	Footnote (3)	NA	NA	NA
Inorganics													
Aluminum	mg/kg	2.23E+04	1.58E+05	1.50E+05	--	--	mg/kg	1.50E+05	Max	Footnote (3)	NA	NA	NA
Arsenic	mg/kg	1.16E+00	4.01E+00	2.60E+00	/J	4	mg/kg	2.60E+00	Max	Footnote (3)	NA	NA	NA
Barium	mg/kg	5.07E+01	7.38E+01	1.15E+02	--	--	mg/kg	7.38E+01	95%UCL-T	Footnote (2)	NA	NA	NA
Chromium	mg/kg	6.08E+01	1.86E+03	1.35E+02	/J	4	mg/kg	1.35E+02	Max	Footnote (3)	NA	NA	NA
Copper	mg/kg	5.85E+01	2.95E+03	2.27E+02	--	--	mg/kg	2.27E+02	Max	Footnote (3)	NA	NA	NA
Iron	mg/kg	4.16E+03	1.04E+04	9.82E+03	--	--	mg/kg	9.82E+03	Max	Footnote (3)	NA	NA	NA
Vanadium	mg/kg	8.74E+00	2.33E+01	2.63E+01	--	--	mg/kg	2.33E+01	95%UCL-T	Footnote (2)	NA	NA	NA

ft bls - Feet Below Land Surface.

NA - Not Applicable.

-- - No Value.

Data Qualifiers (Laboratory/Analysis) and Data Validation (DV) codes: refer to Table 2-2 for a list of data qualifiers/DV codes.

Statistics: Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N); 95% UCL of Log-transformed Data (95% UCL-T)

(1) Arithmetic mean calculated using results of primary and/or duplicate samples. One half the detection limit was used for non-detected values.

(2) Data were not tested for normality, due to small sample size. They were assumed to be log-normally distributed.

(3) The 95% UCL exceeded the maximum detected value and the max was selected as the RME.

Note: Based on the combination of molecular weight (< 200 g/mole) and Henry's Law Constant (> 10-5 atm-m3/mole), naphthalene will be evaluated as a VOC when carried through the Human Health Risk Assessment.

Table 4-3

Medium-Specific Exposure Point Concentration Summary — Surface Soil (0-1 ft bls)

Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report

Baseline Human Health Risk Assessment

Former Thompson Industries Site

Madison, Florida

Scenario Timeframe:	Future
Medium:	Surface Soil
Exposure Medium:	Surface Soil
Exposure Point:	Surface Soil

Chemical of Potential Concern	Units	Arithmetic Mean (1)	95% UCL of Normal Data (2)	Maximum Detected Concentration	Maximum Qualifier	Maximum DV Code	EPC Units	Reasonable Maximum Exposure			Central Tendency		
								Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale	Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale
VOCs													
2-Methylnaphthalene	mg/kg	4.48E+00	6.29E+00	8.60E+01	J	–	mg/kg	6.29E+00	95%UCL-T	Footnote (3)	NA	NA	NA
Naphthalene	mg/kg	5.76E+01	4.06E+01	1.40E+03	–	–	mg/kg	4.06E+01	95%UCL-T	Footnote (3)	NA	NA	NA
Xylenes (total)	mg/kg	1.55E+00	1.55E+01	3.10E+01	–	–	mg/kg	1.55E+01	95%UCL-T	Footnote (3)	NA	NA	NA
SVOCs													
Benzo(a)pyrene	mg/kg	3.10E+00	5.33E+00	1.10E-01	J	–	mg/kg	1.10E-01	Max	Footnote (4)	NA	NA	NA
bis(2-Ethylhexyl)phthalate	mg/kg	5.95E+00	8.58E+00	1.20E+02	–	–	mg/kg	8.58E+00	95%UCL-T	Footnote (3)	NA	NA	NA
Inorganics													
Aluminum	mg/kg	9.96E+03	9.56E+03	1.50E+05	–	–	mg/kg	9.56E+03	95%UCL-T	Footnote (3)	NA	NA	NA
Arsenic	mg/kg	1.10E+00	1.89E+00	8.70E+00	J	4	mg/kg	1.89E+00	95%UCL-T	Footnote (3)	NA	NA	NA
Barium	mg/kg	4.18E+01	5.26E+01	1.37E+02	–	–	mg/kg	5.26E+01	95%UCL-T	Footnote (3)	NA	NA	NA
Chromium	mg/kg	7.20E+01	2.47E+02	8.71E+02	–	–	mg/kg	2.47E+02	95%UCL-T	Footnote (3)	NA	NA	NA
Copper	mg/kg	1.17E+02	2.01E+02	2.36E+03	–	–	mg/kg	2.01E+02	95%UCL-T	Footnote (3)	NA	NA	NA
Iron	mg/kg	8.15E+03	9.05E+03	1.18E+05	–	–	mg/kg	9.05E+03	95%UCL-T	Footnote (3)	NA	NA	NA
Lead	mg/kg	3.55E+01	7.73E+01	4.22E+02	–	–	mg/kg	7.73E+01	95%UCL-T	Footnote (3)	NA	NA	NA
Manganese	mg/kg	7.20E+01	1.03E+02	5.39E+02	–	–	mg/kg	1.03E+02	95%UCL-T	Footnote (3)	NA	NA	NA
Nickel	mg/kg	2.32E+01	5.26E+01	3.23E+03	–	–	mg/kg	5.26E+01	95%UCL-T	Footnote (3)	NA	NA	NA
Thallium	mg/kg	5.80E-01	6.44E-01	5.50E+00	–	–	mg/kg	6.44E-01	95%UCL-T	Footnote (3)	NA	NA	NA
Vanadium	mg/kg	8.52E+00	1.32E+01	2.63E+01	–	–	mg/kg	1.32E+01	95%UCL-T	Footnote (3)	NA	NA	NA
Zinc	mg/kg	2.61E+02	1.41E+03	2.89E+03	–	–	mg/kg	1.41E+03	95%UCL-T	Footnote (3)	NA	NA	NA
Pesticides													
4,4'-DDT	mg/kg	1.55E+00	1.26E+00	3.80E+01	–	–	mg/kg	1.26E+00	95%UCL-T	Footnote (3)	NA	NA	NA
PCBs													
Aroclor 1260	mg/kg	1.85E-01	3.33E-01	6.40E-01	–	–	mg/kg	3.33E-01	95%UCL-T	Footnote (3)	NA	NA	NA

0 bls - Feet Below Land Surface.

NA - Not Applicable.

– - No Value.

Data Qualifiers (Laboratory/Analysis) and Data Validation (DV) codes: refer to Table 2-2 for a list of data qualifiers/DV codes.

Statistics: Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N); 95% UCL of Log-transformed Data (95% UCL-T)

(1) Arithmetic mean calculated using results of primary and/or duplicate samples. One half the detection limit was used for non-detected values.

(2) Data were tested for normality. If not normal, distribution was assumed to be log-normal.

(3) Shapiro-Wilk W Test indicates data are log-normally distributed.

(4) The 95% UCL exceeded the maximum detected value and the max was selected as the RME.

Note: Based on the combination of molecular weight (< 200 g/mole) and Henry's Law Constant (> 10-5 atm-m3/mole), 2-methylnaphthalene and naphthalene will be evaluated as VOCs when carried through the Human Health Risk Assessment.

Table 4-4

Medium-Specific Exposure Point Concentration Summary — Subsurface Soil (0-4 ft bls) — Exposed Soil Only

Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report

Baseline Human Health Risk Assessment

Former Thompson Industries Site

Madison, Florida

Scenario Timeframe:	*Future*
Medium:	Subsurface Soil
Exposure Medium:	Subsurface Soil
Exposure Point:	Exposed Subsurface Soil

Chemical of Potential Concern	Units	Arithmetic (1) Mean	95% UCL (2) of Normal Data	Maximum Detected Concentration	Maximum Qualifier	Maximum DV Code	EPC Units	Reasonable Maximum Exposure			Central Tendency		
								Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale	Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale
VOCs													
Naphthalene	mg/kg	2.50E+00	2.32E+01	2.00E+01	--	--	mg/kg	2.00E+01	Max	Footnote (4)	NA	NA	NA
Inorganics													
Aluminum	mg/kg	1.88E+04	5.67E+04	1.50E+05	--	--	mg/kg	5.67E+04	95%UCL-T	Footnote (3)	NA	NA	NA
Arsenic	mg/kg	1.03E+00	1.52E+00	2.60E+00	/J	4	mg/kg	1.52E+00	95%UCL-N	Footnote (5)	NA	NA	NA
Barium	mg/kg	4.80E+01	6.45E+01	1.15E+02	--	--	mg/kg	6.45E+01	95%UCL-T	Footnote (3)	NA	NA	NA
Chromium	mg/kg	5.07E+01	9.59E+02	1.35E+02	/J	4	mg/kg	1.35E+02	Max	Footnote (4)	NA	NA	NA
Copper	mg/kg	4.81E+01	1.42E+03	2.27E+02	--	--	mg/kg	2.27E+02	Max	Footnote (4)	NA	NA	NA
Iron	mg/kg	3.74E+03	5.36E+03	9.82E+03	--	--	mg/kg	5.36E+03	95%UCL-N	Footnote (5)	NA	NA	NA
Vanadium	mg/kg	8.03E+00	2.01E+01	2.63E+01	--	--	mg/kg	2.01E+01	95%UCL-T	Footnote (3)	NA	NA	NA

ft bls - Feet Below Land Surface.

NA - Not Applicable.

-- - No Value.

Data Qualifiers (Laboratory/Analysis) and Data Validation (DV) codes: refer to Table 2-2 for a list of data qualifiers/DV codes.

Statistics: Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N); 95% UCL of Log-transformed Data (95% UCL-T)

(1) Arithmetic mean calculated using results of primary and/or duplicate samples. One half the detection limit was used for non-detected values.

(2) Data were tested for normality. If not normal, distribution was assumed to be log-normal.

(3) Shapiro-Wilk W Test indicates data are log-normally distributed.

(4) The 95% UCL exceeded the maximum detected value and the max was selected as the RME.

(5) Shapiro-Wilk W Test indicates data are normally distributed.

Note: Based on the combination of molecular weight (< 200 g/mole) and Henry's Law Constant (> 10-5 atm-m3/mole), naphthalene will be evaluated as a VOC when carried through the Human Health Risk Assessment.

Table 4-5

Medium-Specific Exposure Point Concentration Summary — Subsurface Soil (0-4 ft bls)

Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report

Baseline Human Health Risk Assessment

Former Thompson Industries Site

Madison, Florida

Scenario Timeframe:	Future
Medium:	Subsurface Soil
Exposure Medium:	Subsurface Soil
Exposure Point:	Subsurface Soil

Chemical of Potential Concern	Units	Arithmetic Mean (1)	95% UCL of Normal Data (2)	Maximum Detected Concentration	Maximum Qualifier	Maximum DV Code	EPC Units	Reasonable Maximum Exposure			Central Tendency		
								Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale	Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale
VOCs													
2-Methylnaphthalene	mg/kg	3.44E+00	3.12E+00	8.60E+01	J/	–	mg/kg	3.12E+00	95%UCL-T	Footnote (3)	NA	NA	NA
cis-1,2-Dichloroethene	mg/kg	4.40E-01	1.04E+00	9.70E+00	E/	–	mg/kg	1.04E+00	95%UCL-T	Footnote (3)	NA	NA	NA
Naphthalene	mg/kg	4.25E+01	1.10E+01	1.40E+03	–	–	mg/kg	1.10E+01	95%UCL-T	Footnote (3)	NA	NA	NA
Vinyl chloride (Chloroethene)	mg/kg	2.25E-01	2.83E-01	4.90E+00	–	–	mg/kg	2.83E-01	95%UCL-T	Footnote (3)	NA	NA	NA
Xylenes (total)	mg/kg	1.51E+00	1.30E+01	3.10E+01	–	–	mg/kg	1.30E+01	95%UCL-T	Footnote (3)	NA	NA	NA
SVOCs													
Benzo(a)pyrene	mg/kg	2.40E+00	2.54E+00	1.10E-01	J/	–	mg/kg	1.10E-01	Max	Footnote (4)	NA	NA	NA
bis(2-Ethylhexyl)phthalate	mg/kg	4.50E+00	3.61E+00	1.20E+02	–	–	mg/kg	3.61E+00	95%UCL-T	Footnote (3)	NA	NA	NA
Inorganics													
Aluminum	mg/kg	8.12E+03	6.98E+03	1.50E+05	–	–	mg/kg	6.98E+03	95%UCL-T	Footnote (3)	NA	NA	NA
Antimony	mg/kg	4.31E-01	4.57E-01	4.80E+00	–	–	mg/kg	4.57E-01	95%UCL-T	Footnote (3)	NA	NA	NA
Arsenic	mg/kg	9.19E-01	1.37E+00	8.70E+00	J/	4	mg/kg	1.37E+00	95%UCL-T	Footnote (3)	NA	NA	NA
Barium	mg/kg	3.91E+01	4.65E+01	1.37E+02	–	–	mg/kg	4.65E+01	95%UCL-T	Footnote (3)	NA	NA	NA
Chromium	mg/kg	5.42E+01	1.03E+02	8.71E+02	–	–	mg/kg	1.03E+02	95%UCL-T	Footnote (3)	NA	NA	NA
Copper	mg/kg	8.68E+01	6.80E+01	2.36E+03	–	–	mg/kg	6.80E+01	95%UCL-T	Footnote (3)	NA	NA	NA
Iron	mg/kg	6.50E+03	6.38E+03	1.18E+05	–	–	mg/kg	6.38E+03	95%UCL-T	Footnote (3)	NA	NA	NA
Lead	mg/kg	2.80E+01	4.52E+01	4.22E+02	–	–	mg/kg	4.52E+01	95%UCL-T	Footnote (3)	NA	NA	NA
Manganese	mg/kg	6.03E+01	7.82E+01	5.39E+02	–	–	mg/kg	7.82E+01	95%UCL-T	Footnote (3)	NA	NA	NA
Nickel	mg/kg	1.75E+01	2.21E+01	3.23E+02	–	–	mg/kg	2.21E+01	95%UCL-T	Footnote (3)	NA	NA	NA
Thallium	mg/kg	5.00E-01	5.10E-01	5.50E+00	–	–	mg/kg	5.10E-01	95%UCL-T	Footnote (3)	NA	NA	NA
Vanadium	mg/kg	7.43E+00	1.07E+01	2.63E+01	–	–	mg/kg	1.07E+01	95%UCL-T	Footnote (3)	NA	NA	NA
Zinc	mg/kg	2.01E+02	6.69E+02	2.89E+03	–	–	mg/kg	6.69E+02	95%UCL-T	Footnote (3)	NA	NA	NA
Pesticides													
4,4'-DDT	mg/kg	1.14E+00	1.94E-01	3.80E+01	–	–	mg/kg	1.94E-01	95%UCL-T	Footnote (3)	NA	NA	NA
PCBs													
Aroclor 1260	mg/kg	1.51E-01	2.00E-01	6.40E-01	–	–	mg/kg	2.00E-01	95%UCL-T	Footnote (3)	NA	NA	NA

ft bls - Feet Below Land Surface.
NA - Not Applicable.
'– - No Value.
Data Qualifiers (Laboratory/Analysis) and Data Validation (DV) codes: refer to Table 2-2 for a list of data qualifiers/DV codes.
Statistics: Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N); 95% UCL of Log-transformed Data (95% UCL-T)

(1) Arithmetic mean calculated using results of primary and/or duplicate samples. One half the detection limit was used for non-detected values.
(2) Data were tested for normality. If not normal, distribution was assumed to be log-normal.
(3) Shapiro-Wilk W Test indicates data are log-normally distributed.
(4) The 95% UCL exceeded the maximum detected value and the max was selected as the RME.

Note: Based on the combination of molecular weight (< 200 g/mole) and Henry's Law Constant (> 10-5 atm-m3/mole), 2-methylnaphthalene and naphthalene will be evaluated as VOCs when carried through the Human Health Risk Assessment.

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Table 4-6

Medium-Specific Exposure Point Concentration Summary — Surface Water — Unnamed Natural Pond Area

Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report

Baseline Human Health Risk Assessment

Former Thompson Industries Site

Madison, Florida

Scenario Timeframe:	Current/Future
Medium:	Surface Water
Exposure Medium:	Surface Water
Exposure Point:	Surface Water - Unnamed Natural Pond Area

Chemical of Potential Concern	Units	Arithmetic Mean (1)	95% UCL of Normal Data (2)	Maximum Detected Concentration	Maximum Qualifier	Maximum DV Code	EPC Units	Reasonable Maximum Exposure			Central Tendency		
								Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale	Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale
Inorganics													
Chromium	mg/L	5.45E-03	6.94E-03	8.50E-03	B/	--	mg/L	6.94E-03	95%UCL-T	Footnote (2)	NA	NA	NA
Iron	mg/L	2.57E+00	6.02E+01	8.35E+00	--	--	mg/L	8.35E+00	Max	Footnote (3)	NA	NA	NA
Manganese	mg/L	1.05E-01	4.67E-01	2.74E-01	--	--	mg/L	2.74E-01	Max	Footnote (3)	NA	NA	NA
Pesticides													
4,4'-DDD	mg/L	6.43E-05	3.40E-04	2.60E-04	/J	11	mg/L	2.60E-04	Max	Footnote (3)	NA	NA	NA
4,4'-DDE	mg/L	3.34E-05	5.64E-05	7.50E-05	--	--	mg/L	5.64E-05	95%UCL-T	Footnote (2)	NA	NA	NA
4,4'-DDT	mg/L	1.08E-04	1.50E-03	5.10E-04	/J	11	mg/L	5.10E-04	Max	Footnote (3)	NA	NA	NA
alpha-Chlordane	mg/L	2.48E-05	2.56E-05	2.30E-05	J/	--	mg/L	2.30E-05	Max	Footnote (3)	NA	NA	NA
beta-BHC	mg/L	2.43E-05	2.63E-05	2.00E-05	J/N	12	mg/L	2.00E-05	Max	Footnote (3)	NA	NA	NA
gamma-Chlordane	mg/L	2.41E-05	2.68E-05	1.90E-05	J/	--	mg/L	1.90E-05	Max	Footnote (3)	NA	NA	NA

NA - Not Applicable.

-- - No Value.

Data Qualifiers (Laboratory/Analysis) and Data Validation (DV) codes: refer to Table 2-2 for a list of data qualifiers/DV codes.

Statistics: Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N); 95% UCL of Log-transformed Data (95% UCL-T)

(1) Arithmetic mean calculated using results of primary and/or duplicate samples. One half the detection limit was used for non-detected values.

(2) Data were not tested for normality, due to small sample size. They were assumed to be log-normally distributed.

(3) The 95% UCL exceeded the maximum detected value and the max was selected as the RME.

Table 4-7

Medium-Specific Exposure Point Concentration Summary — Surface Water — Mill Pond

Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report

Baseline Human Health Risk Assessment

Former Thompson Industries Site

Madison, Florida

Scenario Timeframe:	Current/Future
Medium:	Surface Water
Exposure Medium:	Surface Water
Exposure Point:	Surface Water - Mill Pond

Chemical of Potential Concern	Units	Arithmetic (1) Mean	95% UCL (2) of Normal Data	Maximum Detected Concentration	Maximum Qualifier	Maximum DV Code	EPC Units	Reasonable Maximum Exposure			Central Tendency		
								Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale	Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale
VOCs													
cis-1,2-Dichloroethene	mg/L	4.53E-04	6.70E-04	3.10E-04	J/	--	mg/L	3.10E-04	Max	Footnote (3)	NA	NA	NA
Vinyl chloride (Chloroethene)	mg/L	1.26E-03	5.74E-02	3.55E-03	/J	11	mg/L	3.55E-03	Max	Footnote (3)	NA	NA	NA
SVOCs													
bis(2-Ethylhexyl)phthalate	mg/L	6.16E-03	1.14E-02	9.65E-03	J/	--	mg/L	9.65E-03	Max	Footnote (3)	NA	NA	NA
Inorganics													
Iron	mg/L	1.32E-01	1.39E+01	3.52E-01	--	--	mg/L	3.52E-01	Max	Footnote (3)	NA	NA	NA
Pesticides													
beta-BHC	mg/L	3.48E-05	6.54E-05	4.80E-05	J/	--	mg/L	4.80E-05	Max	Footnote (3)	NA	NA	NA

NA - Not Applicable.

-- - No Value.

Data Qualifiers (Laboratory/Analysis) and Data Validation (DV) codes: refer to Table 2-2 for a list of data qualifiers/DV codes.

Statistics: Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N); 95% UCL of Log-transformed Data (95% UCL-T)

(1) Arithmetic mean calculated using results of primary and/or duplicate samples. One half the detection limit was used for non-detected values.

(2) Data were not tested for normality, due to small sample size. They were assumed to be log-normally distributed.

(3) The 95% UCL exceeded the maximum detected value and the max was selected as the RME.

Table 4-8

Medium-Specific Exposure Point Concentration Summary — Sediment — Unnamed Natural Pond Area

Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report

Baseline Human Health Risk Assessment

Former Thompson Industries Site

Madison, Florida

Scenario Timeframe:	Current/Future
Medium:	Sediment
Exposure Medium:	Sediment
Exposure Point:	Sediment - Unnamed Natural Pond Area

Chemical of Potential Concern	Units	Arithmetic Mean (1)	95% UCL (2) of Normal Data	Maximum Detected Concentration	Maximum Qualifier	Maximum DV Code	EPC Units	Reasonable Maximum Exposure			Central Tendency		
								Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale	Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale
SVOCs													
Benzo(a)pyrene	mg/kg	7.27E-01	1.42E+00	7.80E-01	J/J	10	mg/kg	7.80E-01	Max	Footnote (4)	NA	NA	NA
Benzo(b)fluoranthene	mg/kg	7.26E-01	1.68E+00	1.30E+00	J/J	10	mg/kg	1.30E+00	Max	Footnote (4)	NA	NA	NA
Indeno(1,2,3-cd)pyrene	mg/kg	7.19E-01	1.39E+00	6.70E-01	J/J	10	mg/kg	6.70E-01	Max	Footnote (4)	NA	NA	NA
Inorganics													
Aluminum	mg/kg	1.40E+04	1.80E+04	3.15E+04	--	--	mg/kg	1.80E+04	95%UCL-N	Footnote (5)	NA	NA	NA
Arsenic	mg/kg	4.44E+00	6.02E+00	1.05E+01	--	--	mg/kg	6.02E+00	95%UCL-N	Footnote (5)	NA	NA	NA
Barium	mg/kg	1.87E+02	2.42E+02	4.03E+02	--	--	mg/kg	2.42E+02	95%UCL-N	Footnote (5)	NA	NA	NA
Cadmium	mg/kg	2.27E+00	3.19E+00	5.50E+00	--	--	mg/kg	3.19E+00	95%UCL-N	Footnote (5)	NA	NA	NA
Chromium	mg/kg	5.03E+02	1.45E+04	1.77E+03	J	4	mg/kg	1.77E+03	Max	Footnote (4)	NA	NA	NA
Iron	mg/kg	1.14E+04	1.45E+04	2.19E+04	J	4	mg/kg	1.45E+04	95%UCL-N	Footnote (5)	NA	NA	NA
Vanadium	mg/kg	3.64E+01	4.90E+01	9.93E+01	--	--	mg/kg	4.90E+01	95%UCL-N	Footnote (5)	NA	NA	NA

NA - Not Applicable.

-- - No Value.

Data Qualifiers (Laboratory/Analysis) and Data Validation (DV) codes: refer to Table 2-2 for a list of data qualifiers/DV codes.

Statistics: Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N); 95% UCL of Log-transformed Data (95% UCL-T)

(1) Arithmetic mean calculated using results of primary and/or duplicate samples. One half the detection limit was used for non-detected values.

(2) Data were tested for normality. If not normal, distribution was assumed to be log-normal.

(3) Shapiro-Wilk W Test indicates data are log-normally distributed.

(4) The 95% UCL exceeded the maximum detected value and the max was selected as the RME.

(5) Shapiro-Wilk W Test indicates data are normally distributed.

Table 4-9

Medium-Specific Exposure Point Concentration Summary — Sediment — Mill Pond

Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report

Baseline Human Health Risk Assessment

Former Thompson Industries Site

Madison, Florida

Scenario Timeframe:	Current/Future
Medium:	Sediment
Exposure Medium:	Sediment
Exposure Point:	Sediment - Mill Pond

Chemical of Potential Concern	Units	Arithmetic Mean (1)	95% UCL of Normal Data (2)	Maximum Detected Concentration	Maximum Qualifier	Maximum DV Code	EPC Units	Reasonable Maximum Exposure			Central Tendency		
								Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale	Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale
Inorganics													
Vanadium	mg/kg	2.32E+01	4.92E+01	2.76E+01	B/	--	mg/kg	2.76E+01	Max	Footnote (3)	NA	NA	NA

NA - Not Applicable.

-- - No Value.

Data Qualifiers (Laboratory/Analysis) and Data Validation (DV) codes: refer to Table 2-2 for a list of data qualifiers/DV codes.

Statistics: Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N); 95% UCL of Log-transformed Data (95% UCL-T)

(1) Arithmetic mean calculated using results of primary and/or duplicate samples. One half the detection limit was used for non-detected values.

(2) Data were not tested for normality, due to small sample size. They were assumed to be log-normally distributed.

(3) The 95% UCL exceeded the maximum detected value and the max was selected as the RME.

Table 4-10

Medium-Specific Exposure Point Concentration Summary — Groundwater — On-Site Surficial Aquifer

Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report

Baseline Human Health Risk Assessment

Former Thompson Industries Site

Madison, Florida

Scenario Timeframe:	Future
Medium:	Groundwater
Exposure Medium:	Groundwater
Exposure Point:	Groundwater — On-Site Surficial Aquifer

Chemical of Potential Concern	Units	Arithmetic Mean [1]	95% UCL of Normal Data [2]	Maximum Detected Concentration	Maximum Qualifier	Maximum DV Code	EPC Units	Reasonable Maximum Exposure			Central Tendency		
								Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale	Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale
VOCs													
1,1-Dichloroethene	mg/L	2.23E-03	3.19E+00	7.40E-03	--	--	mg/L	2.23E-03	Mean	Footnote (4)	NA	NA	NA
1,4-Dichlorobenzene	mg/L	4.88E-03	5.17E-03	4.40E-03	J/	--	mg/L	4.40E-03	Max	Footnote (3)	NA	NA	NA
Benzene	mg/L	4.65E-03	3.53E+00	8.90E-03	--	--	mg/L	4.65E-03	Mean	Footnote (4)	NA	NA	NA
Chloroform	mg/L	4.58E-04	6.43E-04	3.30E-04	J/	--	mg/L	3.30E-04	Max	Footnote (4)	NA	NA	NA
cis-1,2-Dichloroethene	mg/L	8.09E-01	6.70E+27	3.23E+00	D1/J	12	mg/L	8.09E-01	Mean	Footnote (4)	NA	NA	NA
Naphthalene	mg/L	4.72E-03	5.56E-03	3.60E-03	J/	--	mg/L	3.60E-03	Max	Footnote (3)	NA	NA	NA
Toluene	mg/L	2.23E-02	5.27E+09	8.77E-02	D1M1/	--	mg/L	2.23E-02	Mean	Footnote (4)	NA	NA	NA
trans-1,2-Dichloroethene	mg/L	3.98E-03	8.89E+02	1.42E-02	--	--	mg/L	3.98E-03	Mean	Footnote (4)	NA	NA	NA
Trichloroethene	mg/L	7.80E-01	2.50E+36	3.12E+00	D1/J	12	mg/L	7.80E-01	Mean	Footnote (4)	NA	NA	NA
Vinyl chloride (Chloroethene)	mg/L	9.22E-01	9.18E+17	3.17E+00	D1/J	12	mg/L	9.22E-01	Mean	Footnote (4)	NA	NA	NA
Inorganics													
Iron	mg/L	7.32E+00	2.14E+08	1.89E+01	--	--	mg/L	1.89E+01	Max	Footnote (3)	NA	NA	NA
Manganese	mg/L	4.01E-01	5.53E+02	1.07E+00	/J	14	mg/L	1.07E+00	Max	Footnote (3)	NA	NA	NA
Pesticides													
beta-BHC	mg/L	2.74E-05	3.33E-05	3.70E-05	J/	--	mg/L	3.33E-05	95% UCL-T	Footnote (2)	NA	NA	NA
Heptachlor	mg/L	2.36E-05	2.78E-05	1.80E-05	J/N	12	mg/L	1.80E-05	Max	Footnote (3)	NA	NA	NA

NA - Not Applicable.

-- - No Value.

Data Qualifiers (Laboratory/Analysis) and Data Validation (DV) codes: refer to Table 2-2 for a list of data qualifiers/DV codes.

Statistics: Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N); 95% UCL of Log-transformed Data (95% UCL-T); Mean of highly concentrated area of the plume (Mean)

Statistics (Arithmetic Mean, 95% UCL, and Maximum Detect) were performed using results from locations OBGMW22I, OBGMW24S, OBGMW24I, OBGMW25S, and OBGMW25I for non-VOCs, including 1,4-Dichlorobenzene and Naphthalene; and from OBGMW22I, OBGMW24S, OBGMW24I, and OBGMW25S for VOCs.

(1) Arithmetic mean calculated using results of primary and/or duplicate samples. One half the detection limit was used for non-detected values.

(2) Data were not tested for normality, due to small sample size. They were assumed to be log-normally distributed.

(3) The 95% UCL exceeded the maximum detected value and the max was selected as the RME.

(4) The lower of the arithmetic mean and the maximum detected value in the highly concentrated area of the plume (OBGMW22I, OBGMW24S, OBGMW24I, and OBGMW25S) was selected as the RME for VOCs (excluding 1,4-Dichlorobenzene and Naphthalene). See Section 4.3 for explanation.

Note: Based on the combination of molecular weight (< 200 g/mole) and Henry's Law Constant (> 10-5 atm-m3/mole), 1,4-dichlorobenzene and naphthalene will be evaluated as VOCs when carried through the Human Health Risk Assessment.

Table 4-11

Medium-Specific Exposure Point Concentration Summary — Groundwater — Off-Site Surficial Aquifer

Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report

Baseline Human Health Risk Assessment

Former Thompson Industries Site

Madison, Florida

Scenario Timeframe:	Future
Medium:	Groundwater
Exposure Medium:	Groundwater
Exposure Point:	Groundwater — Off-Site Surficial Aquifer

Chemical of Potential Concern	Units	Arithmetic Mean (1)	95% UCL of Normal Data (2)	Maximum Detected Concentration	Maximum Qualifier	Maximum DV Code	EPC Units	Reasonable Maximum Exposure			Central Tendency		
								Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale	Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale
VOCs													
1,1-Dichloroethene	mg/L	2.64E-03	1.03E+02	4.50E-03	--	--	mg/L	2.64E-03	Mean	Footnote (5)	NA	NA	NA
Benzene	mg/L	8.67E-04	7.02E-02	1.60E-03	--	--	mg/L	8.67E-04	Mean	Footnote (5)	NA	NA	NA
cis-1,2-Dichloroethene	mg/L	4.92E-01	2.35E+05	8.50E-01	DI/	--	mg/L	4.92E-01	Mean	Footnote (5)	NA	NA	NA
Trichloroethene	mg/L	5.31E-01	3.82E+08	1.33E+00	DI/	--	mg/L	5.31E-01	Mean	Footnote (5)	NA	NA	NA
Vinyl chloride (Chloroethene)	mg/L	3.08E-01	9.42E+24	8.20E-01	DI/	--	mg/L	3.08E-01	Mean	Footnote (5)	NA	NA	NA
SVOCs													
bis(2-Ethylhexyl)phthalate	mg/L	1.06E-02	1.70E-02	3.12E-02	--	--	mg/L	1.70E-02	95% UCL-T	Footnote (3)	NA	NA	NA
Inorganics													
Chromium	mg/L	2.49E-02	4.67E-02	2.82E-01	--	--	mg/L	4.67E-02	95% UCL-T	Footnote (3)	NA	NA	NA
Cyanide, Total	mg/L	6.77E-03	8.56E-03	2.80E-02	--	--	mg/L	8.56E-03	95% UCL-T	Footnote (3)	NA	NA	NA
Iron	mg/L	7.62E-01	6.38E+00	4.61E+00	/J	11	mg/L	4.61E+00	Max	Footnote (4)	NA	NA	NA
Manganese	mg/L	4.01E-02	9.51E-02	1.11E-01	/J	14	mg/L	9.51E-02	95% UCL-T	Footnote (3)	NA	NA	NA
Nickel	mg/L	1.64E-02	6.68E-02	7.43E-02	--		mg/L	6.68E-02	95% UCL-T	Footnote (3)	NA	NA	NA
Pesticides													
beta-BHC	mg/L	2.48E-05	2.51E-05	2.30E-05	JP/N	12	mg/L	2.30E-05	Max	Footnote (4)	NA	NA	NA
Dieldrin	mg/L	5.30E-05	5.76E-05	8.90E-05	J/N	12	mg/L	5.76E-05	95% UCL-T	Footnote (3)	NA	NA	NA

NA - Not Applicable.

-- - No Value.

Data Qualifiers (Laboratory/Analysis) and Data Validation (DV) codes; refer to Table 2-2 for a list of data qualifiers/DV codes.

Statistics: Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N); 95% UCL of Log-transformed Data (95% UCL-T); Mean of highly concentrated area of the plume (Mean)

Statistics (Arithmetic Mean, 95% UCL, and Maximum Detect) were performed using results from locations OBGMW16S, OBGMW16I, OBGMW17S, OBGMW17I, OBGMW18S, OBGMW18I, OBGMW19S, OBGMW19I, OBGMW20S, OBGMW20I, OBGMW21S, OBGMW21I, and OBGMW23I for non-VOCs; and from locations OBGMW19I, OBGMW21I, and OBGMW23I for VOCs.

(1) Arithmetic mean calculated using results of primary and/or duplicate samples. One half the detection limit was used for non-detected values.

(2) VOC data were not tested for normality, due to small sample size. They were assumed to be log-normally distributed.
Non-VOC data were tested for normality. If not normal, distribution was assumed to be log-normal.

(3) Shapiro-Wilk W Test indicates data are log-normally distributed.

(4) The 95% UCL exceeded the maximum detected value and the max was selected as the RME.

(5) The lower of the arithmetic mean and the maximum detected value in the highly concentrated area of the plume (OBGMW19I, OBGMW21I and OBGMW23I) was selected as the RME. See Section 4.3 for explanation.

Table 4-12

Medium-Specific Exposure Point Concentration Summary — Groundwater — Off-Site Floridan Aquifer

Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report

Baseline Human Health Risk Assessment

Former Thompson Industries Site

Madison, Florida

Scenario Timeframe:	Current/Future
Medium:	Groundwater
Exposure Medium:	Groundwater
Exposure Point:	Groundwater — Off-Site Floridan Aquifer

Chemical of Potential Concern	Units	Arithmetic Mean (1)	95% UCL (2) of Normal Data	Maximum Detected Concentration	Maximum Qualifier	Maximum DV Code	EPC Units	Reasonable Maximum Exposure			Central Tendency		
								Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale	Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale
VOCs													
1,1-Dichloroethene	mg/L	7.05E-04	7.21E-04	8.50E-04	J/	--	mg/L	7.05E-04	Mean	Footnote (4)	NA	NA	NA
Chloroform	mg/L	3.35E-04	3.90E-04	1.70E-04	J/	--	mg/L	1.70E-04	Max	Footnote (4)	NA	NA	NA
cis-1,2-Dichloroethene	mg/L	1.62E-01	1.67E-01	2.02E-01	D1/	--	mg/L	1.62E-01	Mean	Footnote (4)	NA	NA	NA
Trichloroethene	mg/L	2.18E-01	2.45E-01	3.15E-01	D1/	--	mg/L	2.18E-01	Mean	Footnote (4)	NA	NA	NA
Vinyl chloride (Chloroethene)	mg/L	3.70E-04	3.96E-04	2.40E-04	J/	--	mg/L	2.40E-04	Max	Footnote (4)	NA	NA	NA
SVOCs													
bis(2-Ethylhexyl)phthalate	mg/L	7.95E-03	2.13E-02	1.19E-02	--	--	mg/L	1.19E-02	Max	Footnote (3)	NA	NA	NA
Inorganics													
Chromium	mg/L	6.70E-03	1.39E-01	1.53E-02	--	--	mg/L	1.53E-02	Max	Footnote (3)	NA	NA	NA

NA - Not Applicable.

-- - No Value.

Data Qualifiers (Laboratory/Analysis) and Data Validation (DV) codes: refer to Table 2-2 for a list of data qualifiers/DV codes.

Statistics: Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N); 95% UCL of Log-transformed Data (95% UCL-T); Mean of highly concentrated area of the plume (Mean)

Statistics (Arithmetic Mean, 95% UCL, and Maximum Detect) were performed using results from locations OBGMW16D, OBGMW17F, OBGMW18F, and OBGMW20F for non-VOCs; and from locations OBGMW17F and OBGMW18F for VOCs.

(1) Arithmetic mean calculated using results of primary and/or duplicate samples. One half the detection limit was used for non-detected values.

(2) Data were not tested for normality, due to small sample size. They were assumed to be log-normally distributed.

(3) The 95% UCL exceeded the maximum detected value and the max was selected as the RME.

(4) The lower of the arithmetic mean and the maximum detected value in the highly concentrated area of the plume (OBGMW17F and OBGMW18F) was selected as the RME. See Section 4.3 for explanation.

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Table 4-13

Medium-Specific Exposure Point Concentration Summary — Fish Tissue — Mill Pond

Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report

Baseline Human Health Risk Assessment

Former Thompson Industries Site

Madison, Florida

Scenario Timeframe:	Current/Future
Medium:	Surface Water
Exposure Medium:	Animal Tissue
Exposure Point:	Fish from Mill Pond

Chemical of Potential Concern	Units	Arithmetic Mean (1)	95% UCL of Normal Data (2)	Maximum Detected Concentration (3)	Maximum Qualifier	Maximum DV Code	EPC Units	Reasonable Maximum Exposure			Central Tendency		
								Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale	Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale
VOCs													
cis-1,2-Dichloroethene	mg/kg	NC	1.02E-02	4.73E-03	NA	NA	mg/kg	4.73E-03	Max	Footnote (4)	NA	NA	NA
Vinyl chloride (Chloroethene)	mg/kg	NC	3.65E-01	2.26E-02	NA	NA	mg/kg	2.26E-02	Max	Footnote (4)	NA	NA	NA
SVOCs													
bis(2-Ethylhexyl)phthalate	mg/kg	NC	1.62E+02	1.37E+02	NA	NA	mg/kg	1.37E+02	Max	Footnote (4)	NA	NA	NA
Inorganics													
Iron	mg/kg	NC	2.79E+04	7.03E+02	NA	NA	mg/kg	7.03E+02	Max	Footnote (4)	NA	NA	NA
Pesticides													
beta-BHC	mg/kg	NC	1.35E-01	9.92E-02	NA	NA	mg/kg	9.92E-02	Max	Footnote (4)	NA	NA	NA

NC - Not calculated; NA - Not applicable;

Statistics: Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N); 95% UCL of Log-transformed Data (95% UCL-T)

(1) Arithmetic mean was not calculated.

(2) The 95% UCL fish tissue concentrations were modeled from the 95% UCL concentrations of surface water COPCs at Mill Pond (as shown in Table 4-14).

Surface Water data at Mill Pond were not tested for normality, due to small sample size. They were assumed to be log-normally distributed.

(3) Maximum detected concentrations were modeled from measured concentrations of surface water COPCs at Mill Pond.

(4) The 95% UCL exceeded the maximum value and the max was selected as the RME.

Table 5-1
Cancer Toxicity Data — Oral/Dermal
Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report
Baseline Human Health Risk Assessment
Former Thompson Industries Site
Madison, Florida

Chemical of Potential Concern	Oral Cancer Slope Factor (1)	Oral to Dermal Adjustment Factor (2)	Adjusted Dermal Cancer Slope Factor (3)	Units	Weight of Evidence/ Cancer Guideline Description	Source	Date (4) (MM/DD/YY)
VOCs							
1,1-Dichloroethene	ND	ND	ND	ND	C	IRIS	08/30/02
1,4-Dichlorobenzene	2.40E-02	100%	2.40E-02	kg-day/mg	C	HEAST	07/97
2-Methylnaphthalene	ND	ND	ND	ND	C	IRIS	05/21/02
Benzene	5.50E-02	100%	5.50E-02	kg-day/mg	A	IRIS	05/21/02
Chloroform	ND	ND	ND	ND	B2	IRIS	05/21/02
cis-1,2-Dichloroethene	NA	NA	NA	NA	D	IRIS	05/21/02
Naphthalene	ND	ND	ND	ND	C	IRIS	05/21/02
Toluene	NA	NA	NA	NA	D	IRIS	05/21/02
trans-1,2-Dichloroethene	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	4.00E-01	100%	4.00E-01	kg-day/mg	C-B2	NCEA	04/02/02
Vinyl chloride (Chloroethene)	1.40E+00	100%	1.40E+00	kg-day/mg	A	IRIS	05/21/02
Xylenes (total)	NA	NA	NA	NA	D	IRIS	05/21/02
SVOCs							
Benzo(a)pyrene	7.30E+00	100%	7.30E+00	kg-day/mg	B2	IRIS	05/21/02
Benzo(b)fluoranthene	7.30E+00	100%	7.30E+00	kg-day/mg	B2	IRIS	05/21/02
bis(2-Ethylhexyl)phthalate	1.40E-02	100%	1.40E-02	kg-day/mg	B2	IRIS	05/21/02
Indeno(1,2,3-cd)pyrene	7.30E+00	100%	7.30E+00	kg-day/mg	B2	IRIS	05/21/02
Inorganics							
Aluminum	ND	ND	ND	ND	ND	ND	ND
Antimony	ND	ND	ND	ND	ND	ND	ND
Arsenic	1.50E+00	100%	1.50E+00	kg-day/mg	A	IRIS	05/21/02
Barium	NA	NA	NA	NA	D	IRIS	05/21/02
Cadmium	ND	ND	ND	ND	ND	ND	ND
Chromium	NA	NA	NA	NA	D	IRIS	05/21/02
Copper	NA	NA	NA	NA	D	IRIS	05/21/02
Cyanide, Total	NA	NA	NA	NA	D	IRIS	05/21/02
Iron	ND	ND	ND	ND	ND	ND	ND
Lead	ND	ND	ND	ND	B2	IRIS	05/21/02
Manganese	NA	NA	NA	NA	D	IRIS	05/21/02
Nickel	ND	ND	ND	ND	ND	ND	ND
Thallium	NA	NA	NA	NA	D	IRIS	05/21/02
Vanadium	ND	ND	ND	ND	ND	ND	ND
Zinc	NA	NA	NA	NA	D	IRIS	05/21/02
Pesticides							
4,4'-DDD	2.40E-01	100%	2.40E-01	kg-day/mg	B2	IRIS	05/21/02
4,4'-DDE	3.40E-01	100%	3.40E-01	kg-day/mg	B2	IRIS	05/21/02
4,4'-DDT	3.40E-01	100%	3.40E-01	kg-day/mg	B2	IRIS	05/21/02
alpha-Chlordane	3.50E-01	100%	3.50E-01	kg-day/mg	B2	IRIS	05/21/02
beta-BHC	1.80E+00	100%	1.80E+00	kg-day/mg	C	IRIS	05/21/02
Dieldrin	1.60E+01	100%	1.60E+01	kg-day/mg	B2	IRIS	05/21/02
gamma-Chlordane	3.50E-01	100%	3.50E-01	kg-day/mg	B2	IRIS	05/21/02
Heptachlor	4.50E+00	100%	4.50E+00	kg-day/mg	B2	IRIS	05/21/02
PCBs							
Aroclor 1260	2.00E+00	100%	2.00E+00	kg-day/mg	B2	IRIS	05/21/02

NA = Not Applicable
ND = No Data
HEAST= Health Effects Assessment Summary Tables
IRIS = Integrated Risk Information System
NCEA = National Center for Environmental Assessment
(1) Oral slope factor for benzo(a)pyrene used for benzo(b)fluoranthene and indeno(1,2,3-cd)pyrene;
technical chlordane used for alpha-chlordane and gamma-chlordane;
PCBs used for aroclor 1260;
For chloroform, the oral reference dose is protective against cancer risk.
(2) Oral to dermal adjustment factors (GI absorption factors) are provided in Table 5-5.
(3) Dermal SF = (Oral SF) / (Oral-to-Dermal Adjustment Factor)
(4) For IRIS values, the date IRIS was searched.
For HEAST values, the date of HEAST.
For NCEA values, the date of the EPA Region 3 Risk-Based Concentration Table.

EPA Group:
A - Human carcinogen
B1 - Probable human carcinogen - indicates that limited human data are available
B2 - Probable human carcinogen - indicates sufficient evidence in animals and inadequate or no evidence in humans
C - Possible human carcinogen
D - Not classifiable as a human carcinogen
E - Evidence of noncarcinogenicity

Table 5-2
Cancer Toxicity Data — Inhalation
Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report
Baseline Human Health Risk Assessment
Former Thompson Industries Site
Madison, Florida

Chemical of Potential Concern	Unit Risk (1)	Units	Adjustment (2)	Inhalation Cancer Slope Factor	Units	Weight of Evidence/ Cancer Guideline Description	Source (3)	Date (4) (MM/DD/YY)
VOCs								
1,1-Dichloroethene	ND	ND	ND	ND	ND	C	IRIS	08/30/02
1,4-Dichlorobenzene	6.29E-06	(ug/m3)-1	3,500	2.20E-02	kg-day/mg	C	NCEA : HEAST	04/02/02 : 07/97
2-Methylnaphthalene	ND	ND	ND	ND	ND	C	IRIS	05/21/02
Benzene	7.80E-06	(ug/m3)-1	3,500	2.73E-02	kg-day/mg	A	IRIS	05/21/02
Chloroform	2.30E-05	(ug/m3)-1	3,500	8.10E-02	kg-day/mg	B2	IRIS	05/21/02
cis-1,2-Dichloroethene	NA	NA	NA	NA	NA	D	IRIS	05/21/02
Naphthalene	ND	ND	ND	ND	ND	C	IRIS	05/21/02
Toluene	NA	NA	NA	NA	NA	D	IRIS	05/21/02
trans-1,2-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	1.14E-04	(ug/m3)-1	3,500	4.00E-01	kg-day/mg	C-B2	NCEA	04/02/02
Vinyl chloride (Chloroethene)	8.80E-06	(ug/m3)-1	3,500	3.08E-02	kg-day/mg	A	IRIS	05/21/02
Xylenes (total)	NA	NA	NA	NA	NA	D	IRIS	05/21/02
SVOCs								
Benzo(a)pyrene	8.86E-04	(ug/m3)-1	3,500	3.10E+00	kg-day/mg	B2	NCEA : IRIS	04/02/2002 : 5/21/2002
bis(2-Ethylhexyl)phthalate	4.00E-06	(ug/m3)-1	3,500	1.40E-02	kg-day/mg	B2	NCEA : IRIS	04/02/2002 : 5/21/2002
Inorganics								
Aluminum	ND	ND	ND	ND	ND	ND	ND	ND
Antimony	ND	ND	ND	ND	ND	ND	ND	ND
Arsenic	4.30E-03	(ug/m3)-1	3,500	1.51E+01	kg-day/mg	A	IRIS	05/21/02
Barium	NA	NA	NA	NA	NA	D	IRIS	05/21/02
Chromium	1.20E-02	(ug/m3)-1	3,500	4.20E+01	kg-day/mg	A	IRIS	05/21/02
Copper	NA	NA	NA	NA	NA	D	IRIS	05/21/02
Iron	ND	ND	ND	ND	ND	ND	ND	ND
Lead	ND	ND	ND	ND	ND	B2	IRIS	05/21/02
Manganese	NA	NA	NA	NA	NA	D	IRIS	05/21/02
Nickel	ND	ND	ND	ND	ND	ND	ND	ND
Thallium	NA	NA	NA	NA	NA	D	IRIS	05/21/02
Vanadium	ND	ND	ND	ND	ND	ND	ND	ND
Zinc	NA	NA	NA	NA	NA	D	IRIS	05/21/02
Pesticides								
4,4'-DDT	9.70E-05	(ug/m3)-1	3,500	3.40E-01	kg-day/mg	B2	IRIS	05/21/02
PCBs								
Aroclor 1260	5.71E-04	(ug/m3)-1	3,500	2.00E+00	kg-day/mg	B2	IRIS	05/21/02

NA = Not Applicable
ND = No Data
HEAST= Health Effects Assessment Summary Tables
IRIS = Integrated Risk Information System
NCEA = National Center for Environmental Assessment
(1) Unit risk for benzo(a)pyrene used for benzo(b)fluoranthene and indeno(1,2,3-cd)pyrene; hexavalent chromium used for chromium; and PCBs used for aroclor 1260.
(2) Adjustment Factor applied to Unit Risk to calculate Inhalation Slope Factor = 70kg x 1/20m3/day x 1000 ug/mg
(3) Sources are shown in the following order — Unit Risk and Slope Factor : Weight of Evidence.
(4) Dates are shown in the following order — Unit Risk and Slope Factor : Weight of Evidence.
The dates shown are:
For IRIS values, the date IRIS was searched.
For HEAST values, the date of HEAST.
For NCEA values, the date of the EPA Region 3 Risk-Based Concentration Table.

EPA Group:
A - Human carcinogen
B1 - Probable human carcinogen - indicates that limited human data are available
B2 - Probable human carcinogen - indicates sufficient evidence in animals and inadequate or no evidence in humans
C - Possible human carcinogen
D - Not classifiable as a human carcinogen
E - Evidence of noncarcinogenicity

Table 5-3
Non-Cancer Toxicity Data — Oral/Dermal
Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report
Baseline Human Health Risk Assessment
Former Thompson Industries Site
Madison, Florida

Chemical of Potential Concern	Chronic/ Subchronic	Oral RfD Value (1)	Oral RfD Units	Oral to Dermal Adjustment Factor (2)	Adjusted Dermal RfD (3)	Units	Primary Target Organ	Combined Uncertainty/Modifying Factors (4)	Sources of RfD: Target Organ	Dates of RfD: Target Organ (5) (MM/DD/YY)
VOCs										
1,1-Dichloroethene	Chronic	5.00E-02	mg/kg-day	100%	5.00E-02	mg/kg-day	liver	100	IRIS	08/30/02
1,4-Dichlorobenzene	Chronic	3.00E-02	mg/kg-day	100%	3.00E-02	mg/kg-day	ND	ND	NCEA	04/02/02
2-Methylnaphthalene	Chronic	2.00E-02	mg/kg-day	100%	2.00E-02	mg/kg-day	body weight	3000	IRIS	05/21/02
Benzene	Chronic	3.00E-03	mg/kg-day	100%	3.00E-03	mg/kg-day	ND	ND	NCEA	04/02/02
Chloroform	Chronic	1.00E-02	mg/kg-day	100%	1.00E-02	mg/kg-day	liver	1000	IRIS	05/21/02
cis-1,2-Dichloroethene	Chronic	1.00E-02	mg/kg-day	100%	1.00E-02	mg/kg-day	blood	3000	HEAST	07/97
Naphthalene	Chronic	2.00E-02	mg/kg-day	100%	2.00E-02	mg/kg-day	body weight	3000	IRIS	05/21/02
Toluene	Chronic	2.00E-01	mg/kg-day	100%	2.00E-01	mg/kg-day	liver/kidney	1000	IRIS	05/21/02
trans-1,2-Dichloroethene	Chronic	2.00E-02	mg/kg-day	100%	2.00E-02	mg/kg-day	blood	1000	IRIS	05/21/02
Trichloroethene (TCE)	Chronic	3.00E-04	mg/kg-day	100%	3.00E-04	mg/kg-day	liver/kidney	ND	NCEA	04/02/02
Vinyl Chloride	Chronic	3.00E-03	mg/kg-day	100%	3.00E-03	mg/kg-day	liver	30	IRIS	05/21/02
Xylene, mixture	Chronic	2.00E+00	mg/kg-day	100%	2.00E+00	mg/kg-day	CNS	100	IRIS	05/21/02
SVOCs										
Benzo(a)pyrene	Chronic	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzo(b)Fluoranthene	Chronic	ND	ND	ND	ND	ND	ND	ND	ND	ND
bis(2-Ethylhexyl)phthalate	Chronic	2.00E-02	mg/kg-day	100%	2.00E-02	mg/kg-day	liver	1000	IRIS	05/21/02
Indeno(1,2,3-cd)pyrene	Chronic	ND	ND	ND	ND	ND	ND	ND	ND	ND
Inorganics										
Aluminum	Chronic	1.00E+00	mg/kg-day	100%	1.00E+00	mg/kg-day	CNS	100	NCEA	04/02/02
Antimony	Chronic	4.00E-04	mg/kg-day	15%	6.00E-05	mg/kg-day	blood	1000	IRIS	05/21/02
Arsenic	Chronic	3.00E-04	mg/kg-day	100%	3.00E-04	mg/kg-day	skin	3	IRIS	05/21/02
Barium	Chronic	7.00E-02	mg/kg-day	7%	4.90E-03	mg/kg-day	kidney	3	IRIS	05/21/02
Cadmium	Chronic	1.00E-03	mg/kg-day	2.5%	2.50E-05	mg/kg-day	none	10	IRIS	05/21/02
Chromium, Total	Chronic	3.00E-03	mg/kg-day	2.5%	7.50E-05	mg/kg-day	none	900	IRIS	05/21/02
Copper	Chronic	3.70E-02	mg/kg-day	100%	3.70E-02	mg/kg-day	GI	ND	HEAST	07/97
Cyanide	Chronic	2.00E-02	mg/kg-day	100%	2.00E-02	mg/kg-day	CNS, thyroid, body weight	500	IRIS	05/21/02
Iron	Chronic	3.00E-01	mg/kg-day	100%	3.00E-01	mg/kg-day	liver	1	NCEA	04/02/02
Lead	Chronic	ND	ND	ND	ND	ND	ND	ND	ND	ND
Manganese	Chronic	2.40E-02	mg/kg-day	4%	9.60E-04	mg/kg-day	CNS	3	IRIS	05/21/02
Nickel	Chronic	2.00E-02	mg/kg-day	4%	8.00E-04	mg/kg-day	body weight	300	IRIS	05/21/02
Thallium	Chronic	8.00E-05	mg/kg-day	100%	8.00E-05	mg/kg-day	blood	3000	IRIS	05/21/02
Vanadium	Chronic	7.00E-03	mg/kg-day	3%	1.82E-04	mg/kg-day	ND	100	HEAST	07/97
Zinc	Chronic	3.00E-01	mg/kg-day	100%	3.00E-01	mg/kg-day	blood	3	IRIS	05/21/02

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Table 5-3
Non-Cancer Toxicity Data — Oral/Dermal
Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report
Baseline Human Health Risk Assessment
Former Thompson Industries Site
Madison, Florida

Chemical of Potential Concern	Chronic/ Subchronic	Oral RfD Value (1)	Oral RfD Units	Oral to Dermal Adjustment Factor (2)	Adjusted Dermal RfD (3)	Units	Primary Target Organ	Combined Uncertainty/Modifying Factors (4)	Sources of RfD: Target Organ	Dates of RfD: Target Organ (5) (MM/DD/YY)
Pesticides										
4,4'-DDD	Chronic	5.00E-04	mg/kg-day	100%	5.00E-04	mg/kg-day	liver	100	IRIS	05/21/02
4,4'-DDE	Chronic	5.00E-04	mg/kg-day	100%	5.00E-04	mg/kg-day	liver	100	IRIS	05/21/02
4,4'-DDT	Chronic	5.00E-04	mg/kg-day	100%	5.00E-04	mg/kg-day	liver	100	IRIS	05/21/02
alpha-Chlordane	Chronic	5.00E-04	mg/kg-day	100%	5.00E-04	mg/kg-day	liver	300	IRIS	05/21/02
beta-BHC	Chronic	3.00E-04	mg/kg-day	100%	3.00E-04	mg/kg-day	liver/kidney	1000	IRIS	05/21/02
Dieldrin	Chronic	5.00E-05	mg/kg-day	100%	5.00E-05	mg/kg-day	liver	100	IRIS	05/21/02
gamma-Chlordane	Chronic	5.00E-04	mg/kg-day	100%	5.00E-04	mg/kg-day	liver	300	IRIS	05/21/02
Heptachlor	Chronic	5.00E-04	mg/kg-day	100%	5.00E-04	mg/kg-day	liver	300	IRIS	05/21/02
PCBs										
Aroclor 1260	Chronic	2.00E-05	mg/kg-day	100%	2.00E-05	mg/kg-day	eye	300	IRIS	05/21/02

ND = No Data
CNS = Central Nervous System
HEAST = Health Effects Assessment Summary Tables
IRIS = Integrated Risk Information System
NCEA = National Center for Environmental Assessment

(1) Oral RfD for naphthalene used for 2-methylnaphthalene; gamma-BHC used for beta-BHC; hexavalent chromium used for total chromium; nickel, soluable salts used for nickel; thallium sulfate used for thallium; 4,4'-DDT used for 4,4'-DDD and 4,4'-DDE; technical chlordane used for alpha-chlordane and gamma-chlordane; and aroclor 1254 used for aroclor 1260.
(2) Oral to dermal adjustment factors (GI absorption factors) are provided in Table 5-5.
(3) Adjusted Dermal RfD = (Oral RfD) x (Oral to Dermal Adjustment Factor)
(4) Represents Uncertainty Factor x Modifying Factor
(5) For IRIS values, the date IRIS was searched.
For HEAST values, the date of HEAST.
For NCEA values, the date of the EPA Region 3 Risk-Based Concentration Table.

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Table 5-4
Non-Cancer Toxicity Data — Inhalation
Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report
Baseline Human Health Risk Assessment
Former Thompson Industries Site
Madison, Florida

Chemical of Potential Concern	Chronic/ Subchronic	Value Inhalation RfC	Units	Adjusted Inhalation RfD (1)	Units	Primary Target Organ	Combined Uncertainty/Modifying Factors (2)	Sources of RfC:RfD: Target Organ	Dates (3) (MM/DD/YY)
VOCs									
1,1-Dichloroethene	Chronic	2.00E-01	mg/m^3	5.71E-02	mg/kg-day	liver	3.00E+01	IRIS	08/30/02
1,4-Dichlorobenzene	Chronic	8.00E-01	mg/m^3	2.29E-01	mg/kg-day	liver	1.00E+02	IRIS	05/21/02
2-Methylnaphthalene	Chronic	3.00E-03	mg/m^3	8.57E-04	mg/kg-day	nose	3.00E+03	IRIS	05/21/02
Benzene	Chronic	5.95E-03	mg/m^3	1.70E-03	mg/kg-day	ND	ND	NCEA	04/02/02
Chloroform	Chronic	3.01E-04	mg/m^3	8.60E-05	mg/kg-day	ND	ND	NCEA	04/02/02
cis-1,2-Dichloroethene	Chronic	ND	ND	ND	ND	ND	ND	ND	ND
Naphthalene	Chronic	3.00E-03	mg/m^3	8.57E-04	mg/kg-day	nose	3.00E+03	IRIS	05/21/02
Toluene	Chronic	4.00E-01	mg/m^3	1.14E-01	mg/kg-day	CNS	3.00E+02	IRIS	05/21/02
trans-1,2-Dichloroethene	Chronic	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	Chronic	ND	ND	ND	ND	ND	ND	ND	ND
Vinyl chloride (Chloroethene)	Chronic	1.00E-01	mg/m^3	2.86E-02	mg/kg-day	liver	3.00E+01	IRIS	05/21/02
Xylenes (total)	Chronic	ND	ND	ND	ND	ND	ND	ND	ND
SVOCs									
Benzo(a)pyrene	Chronic	ND	ND	ND	ND	ND	ND	ND	ND
bis(2-Ethylhexyl)phthalate	Chronic	ND	ND	ND	ND	ND	ND	ND	ND
Inorganics									
Aluminum	Chronic	3.50E-03	mg/m^3	1.00E-03	mg/kg-day	ND	ND	NCEA	04/02/02
Antimony	Chronic	ND	ND	ND	ND	ND	ND	ND	ND
Arsenic	Chronic	ND	ND	ND	ND	ND	ND	ND	ND
Barium	Chronic	ND	ND	ND	ND	ND	ND	ND	ND
Chromium	Chronic	1.00E-04	mg/m^3	2.86E-05	mg/kg-day	lungs	3.00E+02	IRIS	05/21/02
Copper	Chronic	ND	ND	ND	ND	ND	ND	ND	ND
Iron	Chronic	ND	ND	ND	ND	ND	ND	ND	ND
Lead	Chronic	ND	ND	ND	ND	ND	ND	ND	ND
Manganese	Chronic	5.00E-05	mg/m^3	1.43E-05	mg/kg-day	CNS	1.00E+03	IRIS	05/21/02
Nickel	Chronic	ND	ND	ND	ND	ND	ND	ND	ND
Thallium	Chronic	ND	ND	ND	ND	ND	ND	ND	ND
Vanadium	Chronic	ND	ND	ND	ND	ND	ND	ND	ND
Zinc	Chronic	ND	ND	ND	ND	ND	ND	ND	ND

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Table 5-4
Non-Cancer Toxicity Data — Inhalation
Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report
Baseline Human Health Risk Assessment
Former Thompson Industries Site
Madison, Florida

Chemical of Potential Concern	Chronic/ Subchronic	Value Inhalation RfC	Units	Adjusted Inhalation RfD (1)	Units	Primary Target Organ	Combined Uncertainty/Modifying Factors (2)	Sources of RfC:RfD: Target Organ	Dates (3) (MM/DD/YY)
Pesticides									
4,4'-DDT	Chronic	ND	ND	ND	ND	ND	ND	ND	ND
PCBs									
Aroclor 1260	Chronic	ND	ND	ND	ND	ND	ND	ND	ND

ND = No Data
CNS = Central Nervous System
HEAST = Health Effects Assessment Summary Tables
IRIS = Integrated Risk Information System
NCEA = National Center for Environmental Assessment

(1) RfD (mg/kg-day) = [RfC (mg/m3) x 20 m3/day] / 70 kg
RfD for naphthalene used for 2-methylnaphthalene and hexavalent chromium used for chromium.
(2) Represents Uncertainty Factor x Modifying Factor.
(3) For IRIS values, the date IRIS was searched.
For HEAST values, the date of HEAST.
For NCEA values, the date of the EPA Region 3 Risk-Based Concentration Table.

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Table 5-5
Gastrointestinal Absorption Factors For COPCs
Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report
Baseline Human Health Risk Assessment
Former Thompson Industries Site
Madison, Florida

COPC	GI Absorption *
VOCs	
1,1-Dichloroethene	100%
1,4-Dichlorobenzene	100%
2-Methylnaphthalene	100%
Benzene	100%
Chloroform	100%
cis-1,2-Dichloroethene	100%
Naphthalene	100%
Toluene	100%
trans-1,2-Dichloroethene	100%
Trichloroethene	100%
Vinyl chloride (Chloroethene)	100%
Xylenes (total)	100%
SVOCs	
Benzo(a)pyrene	100%
Benzo(b)fluoranthene	100%
bis(2-Ethylhexyl)phthalate	100%
Indeno(1,2,3-cd)pyrene	100%
Inorganics	
Aluminum	100%
Antimony	15%
Arsenic	100%
Barium	7%
Cadmium	2.5%
Chromium	2.5%
Copper	100%
Cyanide, Total	100%
Iron	100%
Lead	100%
Manganese	4%
Nickel	4%
Thallium	100%
Vanadium	3%
Zinc	100%
Pesticides	
4,4'-DDD	100%
4,4'-DDE	100%
4,4'-DDT	100%
alpha-Chlordane	100%
beta-BHC	100%
Dieldrin	100%
gamma-Chlordane	100%
Heptachlor	100%
PCBs	
Aroclor 1260	100%

COPC - Chemical of Potential Concern
GI ABS - Gastrointestinal Absorption
* from Risk Assessment Guidance for Superfund Volume I: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment) Interim. Office of Emergency and Remedial Rsesponse, USEPA, September 2001.

Table 6-1
Summary of Receptor Risks and Hazards for COPCs
Reasonable Maximum Exposure
Current Trespasser Adolescent — Surface Soil (Exposed Soil Only)
Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report
Baseline Human Health Risk Assessment
Former Thompson Industries Site
Madison, Florida

Scenario Timeframe:	Current
Receptor Population:	Trespasser
Receptor Age:	Adolescent

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	Exposed Surface Soil	*VOCs*					*VOCs*					
			Naphthalene	—		—	—	Naphthalene	body weight	0.0003		0.0001	0.0004
			Inorganics					*Inorganics*					
			Aluminum	—		—	—	Aluminum	CNS	0.05		0.002	0.05
			Arsenic	1.70E-07		5.64E-09	1.75E-07	Arsenic	skin	0.003		0.00009	0.003
			Barium	—		—	—	Barium	kidney	0.0003		0.0002	0.0005
			Chromium	—		—	—	Chromium	none	0.01		0.02	0.03
			Copper	—		—	—	Copper	gastrointestinal	0.002		0.00006	0.002
			Iron	—		—	—	Iron	liver	0.01		0.0003	0.01
			Vanadium	—		—	—	Vanadium	ND	0.001		0.001	0.002
			(Total)	1.70E-07	NA	5.64E-09	1.75E-07	(Total)		0.08	NA	0.02	0.1
	Air	Particulates from Exposed Surface Soil	*Inorganics*					*Inorganics*					
			Aluminum		—		—	Aluminum	ND		0.0006		0.0006
			Arsenic		2.29E-11		2.29E-11	Arsenic	NA		—		—
			Barium		—		—	Barium	NA		—		—
			Chromium		3.30E-09		3.30E-09	Chromium	lungs		0.00002		0.00002
			Copper		—		—	Copper	NA		—		—
			Iron		—		—	Iron	NA		—		—
			Vanadium		—		—	Vanadium	NA		—		—
			(Total)	NA	3.32E-09	NA	3.32E-09	(Total)		NA	0.0006	NA	0.0006
		Vapors from Exposed Surface Soil	*VOCs*					*VOCs*					
			Naphthalene		—		—	Naphthalene	nose		0.002		0.002
			(Total)	NA	0.00E+00	NA	0.00E+00	(Total)		NA	0.002	NA	0.002
						Total Risk Across Exposed Surface Soil	1.79E-07					Total Hazard Index Across Exposed Surface Soil	0.1
						Total Risk Across All Media and All Exposure Routes	1.79E-07					Total Hazard Index Across All Media and All Exposure Routes	0.1

NA - Not Applicable
ND - No Data
CNS - Central Nervous System

Target Organ HI per Medium

Organ	Soil	Groundwater	Sediment	Surface Water		
blood	NA	NA	NA	NA	Total blood HI	NA
body weight	0.0004	NA	NA	NA	Total body weight HI	0.0004
CNS	0.05	NA	NA	NA	Total CNS HI	0.05
eye	NA	NA	NA	NA	Total eye HI	NA
gastrointestinal	0.002	NA	NA	NA	Total gastrointestinal HI	0.002
kidney	0.0005	NA	NA	NA	Total kidney HI	0.0005
liver	0.01	NA	NA	NA	Total liver HI	0.01
lungs	0.00002	NA	NA	NA	Total lungs HI	0.00002
nose	0.002	NA	NA	NA	Total nose HI	0.002
skin	0.003	NA	NA	NA	Total skin HI	0.003
thyroid	NA	NA	NA	NA	Total thyroid HI	NA
none/ND	0.03	NA	NA	NA	Total none/ND HI	0.03

Table 6-2
Summary of Receptor Risks and Hazards for COPCs
Reasonable Maximum Exposure
Current Resident Adolescent — Sediment and Surface Water — Unnamed Natural Pond
Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report
Baseline Human Health Risk Assessment
Former Thompson Industries Site
Madison, Florida

Scenario Timeframe:	Current
Receptor Population:	Resident
Receptor Age:	Adolescent

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Sediment	Sediment	Sediment	*SVOCs*					*SVOCs*					
		Unnamed	Benzo(a)pyrene	2.48E-07		8.23E-08	3.30E-07	Benzo(a)pyrene	NA	—		—	—
		Natural Pond	Benzo(b)fluoranthene	4.13E-08		1.37E-08	5.50E-08	Benzo(b)fluoranthene	NA	—		—	—
			Indeno(1,2,3-cd)pyrene	2.13E-08		7.07E-09	2.83E-08	Indeno(1,2,3-cd)pyrene	NA	—		—	—
			Inorganics					*Inorganics*					
			Aluminum	—		—	—	Aluminum	CNS	0.005		0.0002	0.006
			Arsenic	3.93E-07		1.31E-08	4.06E-07	Arsenic	skin	0.006		0.0002	0.006
			Barium	—		—	—	Barium	kidney	0.001		0.0005	0.002
			Cadmium	—		—	—	Cadmium	none	0.001		0.001	0.002
			Chromium	—		—	—	Chromium	none	0.2		0.2	0.4
			Iron	—		—	—	Iron	liver	0.01		0.0005	0.02
			Vanadium	—		—	—	Vanadium	ND	0.002		0.003	0.005
			(Total)	7.03E-07	NA	1.16E-07	8.19E-07	(Total)		0.2	NA	0.2	0.5
Surface Water	Surface Water	Surface Water	*Inorganics*					*Inorganics*					
		Unnamed	Chromium	—		—	—	Chromium	none	0.0001		0.003	0.003
		Natural Pond	Iron	—		—	—	Iron	liver	0.002		0.0008	0.003
			Manganese	—		—	—	Manganese	CNS	0.0007		0.009	0.009
			Pesticides					*Pesticides*					
			4,4'-DDD	5.43E-10		5.05E-08	5.11E-08	4,4'-DDD	liver	0.00003		0.003	0.003
			4,4'-DDE	1.67E-10		1.33E-08	1.35E-08	4,4'-DDE	liver	0.000007		0.0005	0.0006
			4,4'-DDT	1.51E-09		2.16E-07	2.17E-07	4,4'-DDT	liver	0.00006		0.009	0.009
			alpha-Chlordane	7.00E-11		1.21E-09	1.28E-09	alpha-Chlordane	liver	0.000003		0.00005	0.00005
			beta-BHC	3.13E-10		1.96E-09	2.27E-09	beta-BHC	liver/kidney	0.000004		0.00003	0.00003
			gamma-Chlordane	5.78E-11		1.00E-09	1.06E-09	gamma-Chlordane	liver	0.000002		0.00004	0.00004
			(Total)	2.66E-09	NA	2.84E-07	2.86E-07	(Total)		0.003	NA	0.02	0.03

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Table 6-2
Summary of Receptor Risks and Hazards for COPCs
Reasonable Maximum Exposure
Current Resident Adolescent — Sediment and Surface Water — Unnamed Natural Pond
Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report
Baseline Human Health Risk Assessment
Former Thompson Industries Site
Madison, Florida

Scenario Timeframe:	Current
Receptor Population:	Resident
Receptor Age:	Adolescent

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
						Total Risk Across Sediment - Unnamed Natural Pond	8.19E-07					Total Hazard Index Across Sediment - Unnamed Natural Pond	0.5
						Total Risk Across Surface Water - Unnamed Natural Pond	2.86E-07					Total Hazard Index Across Surface Water - Unnamed Natural Pond	0.03
						Total Risk Across All Media and All Exposure Routes	1.11E-06					Total Hazard Index Across All Media and All Exposure Routes	0.5

NA - Not Applicable
ND - No Data
CNS - Central Nervous System

Target Organ HI per Medium

Organ	Soil	Sediment	Surface Water	Groundwater		
blood	NA	NA	NA	NA	Total blood HI	NA
body weight	NA	NA	NA	NA	Total body weight HI	NA
CNS	NA	0.006	0.009	NA	Total CNS HI	0.02
eye	NA	NA	NA	NA	Total eye HI	NA
gastrointestinal	NA	NA	NA	NA	Total gastrointestinal HI	NA
kidney	NA	0.002	0.00003	NA	Total kidney HI	0.002
liver	NA	0.02	0.02	NA	Total liver HI	0.03
lungs	NA	NA	NA	NA	Total lungs HI	NA
nose	NA	NA	NA	NA	Total nose HI	NA
skin	NA	0.006	NA	NA	Total skin HI	0.006
thyroid	NA	NA	NA	NA	Total thyroid HI	NA
none/ND	NA	0.4	0.003	NA	Total none/ND HI	0.4

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Table 6-3
Summary of Receptor Risks and Hazards For COPCs
Reasonable Maximum Exposure
Current Resident Adult — Surface Soil (Exposed Soil Only), Sediment and Surface Water — Mill Pond, and Groundwater — Off-Site Floridan Aquifer
Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report
Baseline Human Health Risk Assessment
Former Thompson Industries Site
Madison, Florida

Scenario Timeframe:	Current
Receptor Population:	Resident
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	Exposed Surface Soil	*VOCs*					*VOCs*					
			Naphthalene	—		—	—	Naphthalene	body weight	0.004		0.0008	0.004
			Inorganics					*Inorganics*					
			Aluminum	—		—	—	Aluminum	CNS	0.5		0.01	0.6
			Arsenic	6.11E-06		1.31E-07	6.24E-06	Arsenic	skin	0.03		0.0007	0.03
			Barium	—		—	—	Barium	kidney	0.004		0.001	0.005
			Chromium	—		—	—	Chromium	nose	0.2		0.1	0.3
			Copper	—		—	—	Copper	gastrointestinal	0.02		0.0005	0.02
			Iron	—		—	—	Iron	liver	0.1		0.005	0.1
			Vanadium	—		—	—	Vanadium	ND	0.01		0.01	0.02
			(Total)	6.11E-06	NA	1.31E-07	6.24E-06	(Total)		0.9	NA	0.2	1
	Air	Particulates from Exposed Surface Soil	*Inorganics*					*Inorganics*					
			Aluminum		—		—	Aluminum	ND		0.03		0.03
			Arsenic		3.80E-09		3.80E-09	Arsenic	NA		—		—
			Barium		—		—	Barium	NA		—		—
			Chromium		5.49E-07		5.49E-07	Chromium	lungs		0.001		0.001
			Copper		—		—	Copper	NA		—		—
			Iron		—		—	Iron	NA		—		—
			Vanadium		—		—	Vanadium	NA		—		—
			(Total)	NA	5.53E-07	NA	5.53E-07	(Total)		NA	0.03	NA	0.03
	Air	Vapors from Exposed Surface Soil	*VOCs*					*VOCs*					
			Naphthalene		—		—	Naphthalene	nose		0.1		0.1
			(Total)	NA	0.00E+00	NA	0.00E+00	(Total)		NA	0.1	NA	0.1
Sediment	Sediment	Sediment Mill Pond	*Inorganics*					*Inorganics*					
			Vanadium	—		—	—	Vanadium	ND	0.01		0.01	0.03
			(Total)	0.00E+00	NA	0.00E+00	0.00E+00	(Total)		0.01	NA	0.01	0.03
Surface Water	Surface Water	Surface Water Mill Pond	*VOCs*					*VOCs*					
			cis-1,2-Dichloroethene	—		—	—	cis-1,2-Dichloroethene	blood	0.00005		0.00005	0.00009
			Vinyl chloride (Chloroethene)	3.19E-06		2.43E-06	5.62E-06	Vinyl chloride (Chloroethene)	liver	0.002		0.001	0.003
			SVOCs					*SVOCs*					
			bis(2-Ethylhexyl)phthalate	8.67E-08		2.99E-07	3.86E-07	bis(2-Ethylhexyl)phthalate	liver	0.0007		0.002	0.003
			Inorganics					*Inorganics*					
			Iron	—		—	—	Iron	liver	0.002		0.0003	0.002
			Pesticides					*Pesticides*					
			beta-BHC	5.55E-08		1.09E-07	1.64E-07	beta-BHC	liver/kidney	0.0002		0.0005	0.0007
			(Total)	3.33E-06	NA	2.84E-06	6.17E-06	(Total)		0.005	NA	0.005	0.009

Table 6-3
Summary of Receptor Risks and Hazards For COPCs
Reasonable Maximum Exposure
Current Resident Adult — Surface Soil (Exposed Soil Only), Sediment and Surface Water — Mill Pond, and Groundwater — Off-Site Floridan Aquifer
Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report
Baseline Human Health Risk Assessment
Former Thompson Industries Site
Madison, Florida

Scenario Timeframe:	Current
Receptor Population:	Resident
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Water	Animal Tissue	Fish from Mill Pond	*VOCs*					*VOCs*					
			cis-1,2-Dichloroethene	—			—	cis-1,2-Dichloroethene	blood	0.0004			0.0004
			Vinyl chloride (Chloroethene)	1.18E-05			1.18E-05	Vinyl chloride (Chloroethene)	liver	0.007			0.007
			SVOCs					*SVOCs*					
			bis(2-Ethylhexyl)phthalate	7.16E-04			7.16E-04	bis(2-Ethylhexyl)phthalate	liver	6			6
			Inorganics					*Inorganics*					
			Iron	—			—	Iron	liver	2			2
			Pesticides					*Pesticides*					
			beta-BHC	6.64E-05			6.64E-05	beta-BHC	liver/kidney	0.3			0.3
			(Total)	7.94E-04	NA	NA	7.94E-04	(Total)		8	NA	NA	8
Groundwater	Groundwater	Groundwater Off-Site Floridan Aquifer	*VOCs*					*VOCs*					
			1,1-Dichloroethene	—		—	—	1,1-Dichloroethene	liver	0.0005		—	0.0005
			Chloroform	—		—	—	Chloroform	liver	0.001		—	0.001
			cis-1,2-Dichloroethene	—		—	—	cis-1,2-Dichloroethene	blood	0.6		—	0.6
			Trichloroethene	1.30E-03		—	1.30E-03	Trichloroethene	liver/kidney	25		—	25
			Vinyl chloride (Chloroethene)	5.00E-06		—	5.00E-06	Vinyl chloride (Chloroethene)	liver	0.003		—	0.003
			SVOCs					*SVOCs*					
			bis(2-Ethylhexyl)phthalate	2.48E-06		1.47E-07	2.63E-06	bis(2-Ethylhexyl)phthalate	liver	0.02		0.001	0.02
			Inorganics					*Inorganics*					
			Chromium	—		—	—	Chromium	none	0.2		0.02	0.2
			(Total)	1.30E-03	NA	1.47E-07	1.30E-03	(Total)		26	NA	0.02	26
	Air	Groundwater Water Vapors at Showerhead Off-Site Floridan Aquifer	*VOCs*					*VOCs*					
			1,1-Dichloroethene		—		—	1,1-Dichloroethene	liver		0.0004		0.0004
			Chloroform		2.05E-07		2.05E-07	Chloroform	ND		0.1		0.1
			cis-1,2-Dichloroethene		—		—	cis-1,2-Dichloroethene	NA		—		—
			Trichloroethene		1.30E-03		1.30E-03	Trichloroethene	NA		—		—
			Vinyl chloride (Chloroethene)		1.10E-07		1.10E-07	Vinyl chloride (Chloroethene)	liver		0.0003		0.0003
			(Total)	NA	1.30E-03	NA	1.30E-03	(Total)		NA	0.07	NA	0.07

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Table 6-3
Summary of Receptor Risks and Hazards For COPCs
Reasonable Maximum Exposure
Current Resident Adult — Surface Soil (Exposed Soil Only), Sediment and Surface Water — Mill Pond, and Groundwater — Off-Site Floridan Aquifer
Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report
Baseline Human Health Risk Assessment
Former Thompson Industries Site
Madison, Florida

Scenario Timeframe:	Current
Receptor Population:	Resident
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total

Total Risk Across Exposed Surface Soil	6.79E-06
Total Risk Across Sediment — Mill Pond	0.00E+00
Total Risk Across Surface Water — Mill Pond	8.00E-04
Total Risk Across Groundwater — Off-Site Floridan Aquifer	2.60E-03
Total Risk Across All Media and All Exposure Routes	3.41E-03

Total Hazard Index Across Exposed Surface Soil	1
Total Hazard Index Across Sediment — Mill Pond	0.03
Total Hazard Index Across Surface Water — Mill Pond	8
Total Hazard Index Across Groundwater — Off-Site Floridan Aquifer	26
Total Hazard Index Across All Media and All Exposure Routes	36

NA - Not Applicable
ND - No Data
CNS - Central Nervous System

Target Organ HI per Medium

Organ	Soil	Sediment	Surface Water	Groundwater		
blood	NA	NA	0.0005	0.6	Total blood HI	0.6
body weight	0.004	NA	NA	NA	Total body weight HI	0.004
CNS	0.6	NA	NA	NA	Total CNS HI	0.6
eye	NA	NA	NA	NA	Total eye HI	NA
gastrointestinal	0.02	NA	NA	NA	Total gastrointestinal HI	0.02
kidney	0.005	NA	0.3	25	Total kidney HI	26
liver	0.1	NA	8	25	Total liver HI	34
lungs	0.001	NA	NA	NA	Total lungs HI	0.001
nose	0.1	NA	NA	NA	Total nose HI	0.1
skin	0.03	NA	NA	NA	Total skin HI	0.03
thyroid	NA	NA	NA	NA	Total thyroid HI	NA
none/ND	0.4	0.03	NA	0.3	Total none/ND HI	0.7

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Table 6-4
Summary of Receptor Risks and Hazards For COPCs
Reasonable Maximum Exposure
Current Resident Child — Surface Soil (Exposed Soil Only), Sediment and Surface Water — Mill Pond, and Groundwater — Off-Site Floridan Aquifer
Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report
Baseline Human Health Risk Assessment
Former Thompson Industries Site
Madison, Florida

Scenario Timeframe:	Current
Receptor Population:	Resident
Receptor Age:	Child

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	Exposed Surface Soil						*VOCs*					
								Naphthalene	body weight	0.01		0.001	0.01
								Inorganics					
								Aluminum	CNS	2		0.02	2
								Arsenic	skin	0.1		0.001	0.1
								Barium	kidney	0.01		0.002	0.02
								Chromium	none	0.6		0.2	0.8
								Copper	gastrointestinal	0.08		0.0007	0.08
								Iron	liver	0.4		0.004	0.4
			(Total)	NA	NA	NA	NA	Vanadium	ND	0.04		0.01	0.05
									(Total)		3	NA	0.3	3
	Air	Particulates from Exposed Surface Soil						*Inorganics*					
								Aluminum	ND		0.09		0.09
								Arsenic	NA		—		—
								Barium	NA		—		—
								Chromium	lungs		0.003		0.003
								Copper	NA		—		—
								Iron	NA		—		—
								Vanadium	NA		—		—
			(Total)	NA	NA	NA	NA		(Total)		NA	0.09	NA	0.09
	Air	Vapors from Exposed Surface Soil						*VOCs*					
								Naphthalene	none		0.3		0.3
			(Total)	NA	NA	NA	NA		(Total)		NA	0.3	NA	0.3
Sediment	Sediment	Sediment Mill Pond						*Inorganics*					
								Vanadium	ND	0.05		0.02	0.07
			(Total)	NA	NA	NA	NA		(Total)	0.05	NA	0.02	0.07
Surface Water	Surface Water	Surface Water Mill Pond						*VOCs*					
								cis-1,2-Dichloroethene	blood	0.0002		0.00007	0.0003
								Vinyl chloride (Chloroethene)	liver	0.008		0.002	0.01
								SVOCs					
								bis(2-Ethylhexyl)phthalate	liver	0.003		0.004	0.007
								Inorganics					
								Iron	liver	0.007		0.0004	0.008
								Pesticides					
			(Total)	NA	NA	NA	NA	beta-BHC	liver/kidney	0.001		0.0007	0.002
									(Total)	0.02	NA	0.007	0.03

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Table 6-4
Summary of Receptor Risks and Hazards For COPCs
Reasonable Maximum Exposure
Current Resident Child — Surface Soil (Exposed Soil Only), Sediment and Surface Water — Mill Pond, and Groundwater — Off-Site Floridan Aquifer
Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report
Baseline Human Health Risk Assessment
Former Thompson Industries Site
Madison, Florida

Scenario Timeframe:	Current
Receptor Population:	Resident
Receptor Age:	Child

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Water	Animal Tissue	Fish Tissue from Mill Pond						*VOCs*					
								cis-1,2-Dichloroethene	blood	0.0007			0.0007
								Vinyl chloride (Chloroethene)	liver	0.01			0.01
								SVOCs					
								bis(2-Ethylhexyl)phthalate	liver	9			9
								Inorganics					
								Iron	liver	3			3
								Pesticides					
								beta-BHC	liver/kidney	0.5			0.5
			(Total)	NA	NA	NA	NA	(Total)		13	NA	NA	13
Groundwater	Groundwater	Groundwater Off-Site Floridan Aquifer						*VOCs*					
								1,1-Dichloroethene	liver	0.0009		—	0.0009
								Chloroform	liver	0.001		—	0.001
								cis-1,2-Dichloroethene	blood	1		—	1
								Trichloroethene	liver/kidney	46		—	46
								Vinyl chloride (Chloroethene)	liver	0.005		—	0.005
								SVOCs					
								bis(2-Ethylhexyl)phthalate	liver	0.04		0.002	0.04
								Inorganics					
			(Total)	NA	NA	NA	NA	Chromium (Total)	none	0.3 48	NA	0.03 0.03	0.4 48
Groundwater	Air	Groundwater Water Vapors at Showerhead Off-Site Floridan Aquifer						*VOCs*					
								1,1-Dichloroethene	liver		0.0008		0.0008
								Chloroform	ND		0.1		0.1
								cis-1,2-Dichloroethene	NA		—		—
								Trichloroethene	NA		—		—
								Vinyl chloride (Chloroethene)	liver		0.0005		0.0005
			(Total)	NA	NA	NA	NA	(Total)		NA	0.1	NA	0.1

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Table 6-4
Summary of Receptor Risks and Hazards For COPCs
Reasonable Maximum Exposure
Current Resident Child — Surface Soil (Exposed Soil Only), Sediment and Surface Water — Mill Pond, and Groundwater — Off-Site Floridan Aquifer
Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report
Baseline Human Health Risk Assessment
Former Thompson Industries Site
Madison, Florida

Scenario Timeframe:	Current
Receptor Population:	Resident
Receptor Age:	Child

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk			
				Ingestion	Inhalation	Dermal	Exposure Routes Total
						Total Risk Across Exposed Surface Soil	NA
						Total Risk Across Sediment — Mill Pond	NA
						Total Risk Across Surface Water — Mill Pond	NA
						Total Risk Across Groundwater — Off-Site Floridan Aquifer	NA
						Total Risk Across All Media and All Exposure Routes	NA

Chemical	Non-Carcinogenic Hazard Quotient				
	Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
				Total Hazard Index Across Exposed Surface Soil	4
				Total Hazard Index Across Sediment — Mill Pond	0.07
				Total Hazard Index Across Surface Water — Mill Pond	13
				Total Hazard Index Across Groundwater — Off-Site Floridan Aquifer	48
				Total Hazard Index Across All Media and All Exposure Routes	65

NA - Not Applicable
ND - No Data
CNS - Central Nervous System

Target Organ HI per Medium

Organs	Soil	Sediment	Surface Water	Groundwater	
blood	NA	NA	0.0009	1	Total blood HI 1
body weight	0.01	NA	NA	NA	Total body weight HI 0.01
CNS	2	NA	NA	NA	Total CNS HI 2
eye	NA	NA	NA	NA	Total eye HI NA
gastrointestinal	0.08	NA	NA	NA	Total gastrointestinal HI 0.08
kidney	0.02	NA	0.5	46	Total kidney HI 47
liver	0.4	NA	13	47	Total liver HI 60
lungs	0.003	NA	NA	NA	Total lungs HI 0.003
nose	0.3	NA	NA	NA	Total nose HI 0.3
skin	0.1	NA	NA	NA	Total skin HI 0.1
thyroid	NA	NA	NA	NA	Total thyroid HI NA
none/ND	0.9	0.07	NA	0.3	Total none/ND HI 1

Table 6-5
Summary of Receptor Risks and Hazards For COPCs
Reasonable Maximum Exposure
Future Industrial Worker — Surface Soil (Exposed Soil Only) and Groundwater — On-Site Surficial Aquifer
Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report
Baseline Human Health Risk Assessment
Former Thompson Industries Site
Madison, Florida

Scenario Timeframe:	Future
Receptor Population:	Industrial Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	Exposed Surface Soil	*VOCs*					*VOCs*					
			Naphthalene	—		—	—	Naphthalene	body weight	0.0005		0.0005	0.001
			Inorganics					*Inorganics*					
			Aluminum	—		—	—	Aluminum	CNS	0.07		0.007	0.08
			Arsenic	6.81E-07		6.81E-08	7.50E-07	Arsenic	skin	0.004		0.0004	0.005
			Barium	—		—	—	Barium	kidney	0.0005		0.0007	0.001
			Chromium	—		—	—	Chromium	none	0.02		0.09	0.1
			Copper	—		—	—	Copper	gastrointestinal	0.003		0.0003	0.003
			Iron	—		—	—	Iron	liver	0.02		0.002	0.02
			Vanadium	—		—	—	Vanadium	ND	0.002		0.006	0.008
			(Total)	6.81E-07	NA	6.81E-08	7.50E-07	(Total)		0.1	NA	0.1	0.2
	Air	Particulates from Exposed Surface Soil	*Inorganics*					*Inorganics*					
			Aluminum		—		—	Aluminum	ND		0.02		0.02
			Arsenic		2.21E-09		2.21E-09	Arsenic	NA		—		—
			Barium		—		—	Barium	NA		—		—
			Chromium		3.20E-07		3.20E-07	Chromium	lungs		0.0007		0.0007
			Copper		—		—	Copper	NA		—		—
			Iron		—		—	Iron	NA		—		—
			Vanadium		—		—	Vanadium	NA		—		—
			(Total)	NA	3.22E-07	NA	3.22E-07	(Total)		NA	0.02	NA	0.02
	Air	Vapors from Exposed Surface Soil	*VOCs*					*VOCs*					
			Naphthalene		—		—	Naphthalene	nose		0.1		0.1
			(Total)	NA	0.00E+00	NA	0.00E+00	(Total)		NA	0.1	NA	0.1

Table 6-5
Summary of Receptor Risks and Hazards For COPCs
Reasonable Maximum Exposure
Future Industrial Worker — Surface Soil (Exposed Soil Only) and Groundwater — On-Site Surficial Aquifer
Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report
Baseline Human Health Risk Assessment
Former Thompson Industries Site
Madison, Florida

Scenario Timeframe:	Future
Receptor Population:	Industrial Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Groundwater	Groundwater On-Site Surficial Aquifer	*VOCs*					*VOCs*					
			1,1-Dichloroethene	—		—	—	1,1-Dichloroethene	liver	0.0004		0.0000005	0.0004
			1,4-Dichlorobenzene	3.69E-07		1.54E-09	3.71E-07	1,4-Dichlorobenzene	ND	0.001		0.000006	0.001
			Benzene	8.94E-07		1.26E-09	8.95E-07	Benzene	ND	0.02		0.00002	0.02
			Chloroform	—		—	—	Chloroform	liver	0.0003		0.0000002	0.0003
			cis-1,2-Dichloroethene	—		—	—	cis-1,2-Dichloroethene	blood	0.8		0.0005	0.8
			Naphthalene	—		—	—	Naphthalene	body weight	0.002		0.000008	0.002
			Toluene	—		—	—	Toluene	liver/kidney	0.001		0.000003	0.001
			trans-1,2-Dichloroethene	—		—	—	trans-1,2-Dichloroethene	blood	0.002		0.0000007	0.002
			Trichloroethene	1.09E-03		1.17E-06	1.09E-03	Trichloroethene	liver/kidney	25		0.03	25
			Vinyl chloride (Chloroethene	4.51E-03		2.21E-06	4.51E-03	Vinyl chloride (Chloroethene	liver	3		0.001	3
			Inorganics					*Inorganics*					
			Iron	—		—	—	Iron	liver	0.6		0.00006	0.6
			Manganese	—		—	—	Manganese	CNS	0.4		0.001	0.4
			Pesticides					*Pesticides*					
			beta-BHC	2.09E-07		2.65E-10	2.10E-07	beta-BHC	liver/kidney	0.001		0.000001	0.001
			Heptachlor	2.83E-07		2.09E-10	2.83E-07	Heptachlor	liver	0.0004		0.0000003	0.0004
			(Total)	5.60E-03	NA	3.39E-06	5.60E-03	(Total)		30	NA	0.03	30
						Total Risk Across Exposed Surface Soil	1.07E-06					Total Hazard Index Across Exposed Surface Soil	0.3
						Total Risk Across Groundwater — On-Site Surficial Aquifer	5.60E-03					Total Hazard Index Across Groundwater — On-Site Surficial Aquifer	30
						Total Risk Across All Media and All Exposure Routes	5.61E-03					Total Hazard Index Across All Media and All Exposure Routes	31

NA - Not Applicable
ND - No Data
CNS - Central Nervous System

Target Organ HI per Medium

Organ	Soil	Sediment	Surface Water	Groundwater		
blood	NA	NA	NA	0.8	Total blood HI	0.8
body weight	0.001	NA	NA	0.002	Total body weight HI	0.003
CNS	0.08	NA	NA	0.4	Total CNS HI	0.5
eye	NA	NA	NA	NA	Total eye HI	NA
gastrointestinal	0.003	NA	NA	NA	Total gastrointestinal HI	0.003
kidney	0.001	NA	NA	25	Total kidney HI	25
liver	0.02	NA	NA	29	Total liver HI	29
lungs	0.0007	NA	NA	NA	Total lungs HI	0.0007
nose	0.1	NA	NA	NA	Total nose HI	0.1
skin	0.005	NA	NA	NA	Total skin HI	0.005
thyroid	NA	NA	NA	NA	Total thyroid HI	NA
none/ND	0.1	NA	NA	0.02	Total none/ND HI	0.2

Table 6-6
Summary of Receptor Risks and Hazards For COPCs
Reasonable Maximum Exposure
Future Industrial Worker — Surface Soil and Groundwater -- On-Site Surficial Aquifer
Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report
Baseline Human Health Risk Assessment
Former Thompson Industries Site
Madison, Florida

Scenario Timeframe:	Future
Receptor Population:	Industrial Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	Surface Soil	*VOCs*					*VOCs*					
			2-Methylnaphthalene	—		—	—	2-Methylnaphthalene	body weight	0.0002		0.0002	0.0003
			Naphthalene	—		—	—	Naphthalene	body weight	0.001		0.001	0.002
			Xylenes (total)	—		—	—	Xylenes (total)	CNS	0.000004		0.000004	0.000008
			SVOCs					*SVOCs*					
			Benzo(a)pyrene	1.40E-07		1.40E-07	2.81E-07	Benzo(a)pyrene	NA	—		—	—
			bis(2-Ethylhexyl)phthalate	2.10E-08		2.10E-08	4.20E-08	bis(2-Ethylhexyl)phthalate	liver	0.0002		0.0002	0.0004
			Inorganics					*Inorganics*					
			Aluminum	—		—	—	Aluminum	CNS	0.005		0.0005	0.005
			Arsenic	4.96E-07		4.96E-08	5.46E-07	Arsenic	skin	0.003		0.0003	0.003
			Barium	—		—	—	Barium	kidney	0.0004		0.0005	0.0009
			Chromium	—		—	—	Chromium	none	0.04		0.2	0.2
			Copper	—		—	—	Copper	gastrointestinal	0.003		0.0003	0.003
			Iron	—		—	—	Iron	liver	0.01		0.001	0.01
			Lead	—		—	—	Lead	NA	—		—	—
			Manganese	—		—	—	Manganese	CNS	0.002		0.005	0.007
			Nickel	—		—	—	Nickel	body weight	0.001		0.003	0.004
			Thallium	—		—	—	Thallium	blood	0.004		0.0004	0.004
			Vanadium	—		—	—	Vanadium	ND	0.0009		0.004	0.004
			Zinc	—		—	—	Zinc	blood	0.002		0.0002	0.003
			Pesticides					*Pesticides*					
			4,4'-DDT	7.46E-08		7.46E-08	1.49E-07	4,4'-DDT	liver	0.001		0.001	0.002
			PCBs	—		—	—	*PCBs*		—		—	—
			Aroclor 1260	1.16E-07		1.16E-07	2.33E-07	Aroclor 1260	eye	0.008		0.008	0.02
			(Total)	8.48E-07	NA	4.02E-07	1.25E-06	(Total)		0.09	NA	0.2	0.3

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Table 6-6
Summary of Receptor Risks and Hazards For COPCs
Reasonable Maximum Exposure
Future Industrial Worker — Surface Soil and Groundwater — On-Site Surficial Aquifer
Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report
Baseline Human Health Risk Assessment
Former Thompson Industries Site
Madison, Florida

Scenario Timeframe:	Future
Receptor Population:	Industrial Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Air	Particulates from Surface Soil	*SVOCs*					SVOCs					
			Benzo(a)pyrene		1.92E-11		1.92E-11	Benzo(a)pyrene	NA		—		—
			bis(2-Ethylhexyl)phthalate		6.77E-12		6.77E-12	bis(2-Ethylhexyl)phthalate	NA		—		—
			Inorganics					*Inorganics*					
			Aluminum		—		—	Aluminum	ND		0.002		0.002
			Arsenic		1.61E-09		1.61E-09	Arsenic	NA		—		—
			Barium		—		—	Barium	NA		—		—
			Chromium		5.85E-07		5.85E-07	Chromium	lungs		0.001		0.001
			Copper		—		—	Copper	NA		—		—
			Iron		—		—	Iron	NA		—		—
			Lead		—		—	Lead	NA		—		—
			Manganese		—		—	Manganese	CNS		0.001		0.001
			Nickel		—		—	Nickel	NA		—		—
			Thallium		—		—	Thallium	NA		—		—
			Vanadium		—		—	Vanadium	NA		—		—
			Zinc		—		—	Zinc	NA		—		—
			Pesticides					*Pesticides*					
			4,4'-DDT		2.41E-11		2.41E-11	4,4'-DDT	NA		—		—
			PCBs					*PCBs*					
			Aroclor 1260		3.76E-11		3.76E-11	Aroclor 1260	NA		—		—
			(Total)	NA	5.86E-07	NA	5.86E-07	(Total)		NA	0.004	NA	0.004
	Air	Vapors from Surface Soil	*VOCs*					*VOCs*					
			2-Methylnaphthalene		—		—	2-Methylnaphthalene	nose		0.03		0.03
			Naphthalene		—		—	Naphthalene	nose		0.2		0.2
			Xylenes (total)		—		—	Xylenes (total)	NA		—		—
			(Total)	NA	0.00E+00	NA	0.00E+00	(Total)		NA	0.2	NA	0.2

Table 6-6
Summary of Receptor Risks and Hazards For COPCs
Reasonable Maximum Exposure
Future Industrial Worker — Surface Soil and Groundwater — On-Site Surficial Aquifer
Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report
Baseline Human Health Risk Assessment
Former Thompson Industries Site
Madison, Florida

Scenario Timeframe:	Future
Receptor Population:	Industrial Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Groundwater	Groundwater - On-Site Surficial Aquifer	*VOCs*					*VOCs*					
			1,1-Dichloroethene	—		—	—	1,1-Dichloroethene	liver	0.0004		0.0000005	0.0004
			1,4-Dichlorobenzene	3.69E-07		1.54E-09	3.71E-07	1,4-Dichlorobenzene	ND	0.001		0.000006	0.001
			Benzene	8.94E-07		1.26E-09	8.95E-07	Benzene	ND	0.02		0.00002	0.02
			Chloroform	—		—	—	Chloroform	liver	0.0003		0.0000002	0.0003
			cis-1,2-Dichloroethene	—		—	—	cis-1,2-Dichloroethene	blood	0.8		0.0005	0.8
			Naphthalene	—		—	—	Naphthalene	body weight	0.002		0.000008	0.002
			Toluene	—		—	—	Toluene	liver/kidney	0.001		0.000003	0.001
			trans-1,2-Dichloroethene	—		—	—	trans-1,2-Dichloroethene	blood	0.002		0.0000007	0.002
			Trichloroethene	1.09E-03		1.17E-06	1.09E-03	Trichloroethene	liver/kidney	25		0.03	25
			Vinyl chloride (Chloroethene	4.51E-03		2.21E-06	4.51E-03	Vinyl chloride (Chloroethene	liver	3		0.001	3
			Inorganics					*Inorganics*					
			Iron	—		—	—	Iron	liver	0.6		0.00006	0.6
			Manganese	—		—	—	Manganese	CNS	0.4		0.001	0.4
			Pesticides					*Pesticides*					
			beta-BHC	2.09E-07		2.65E-10	2.10E-07	beta-BHC	liver/kidney	0.001		0.000001	0.001
			Heptachlor	2.83E-07		2.09E-10	2.83E-07	Heptachlor	liver	0.0004		0.0000003	0.0004
			(Total)	5.60E-03	NA	3.39E-06	5.60E-03	(Total)		30	NA	0.03	30
						Total Risk Across Surface Soil	1.84E-06					Total Hazard Index Across Surface Soil	0.5
						Total Risk Across Groundwater — On-Site Surficial Aquifer	5.60E-03					Total Hazard Index Across Groundwater — On-Site Surficial Aquifer	30
						Total Risk Across All Media and All Exposure Routes	5.61E-03					Total Hazard Index Across All Media and All Exposure Routes	31

NA - Not Applicable
ND - No Data
CNS - Central Nervous System

Target Organ HI per Medium

Organ	Soil	Sediment	Surface Water	Groundwater
blood	0.007	NA	NA	0.8
body weight	0.007	NA	NA	0.002
CNS	0.01	NA	NA	0.4
eye	0.02	NA	NA	NA
gastrointestinal	0.003	NA	NA	NA
kidney	0.0009	NA	NA	25
liver	0.02	NA	NA	29
lungs	0.001	NA	NA	NA
nose	0.2	NA	NA	NA
skin	0.003	NA	NA	NA
thyroid	NA	NA	NA	NA
none/ND	0.2	NA	NA	0.02

Total blood HI	0.8
Total body weight HI	0.009
Total CNS HI	0.5
Total eye HI	0.02
Total gastrointestinal HI	0.003
Total kidney HI	25
Total liver HI	29
Total lungs HI	0.001
Total nose HI	0.2
Total skin HI	0.003
Total thyroid HI	NA
Total none/ND HI	0.2

Table 6-7
Summary of Receptor Risks and Hazards For COPCs
Reasonable Maximum Exposure
Future Industrial Worker — Subsurface Soil (Exposed Soil Only) and Groundwater — On-Site Surficial Aquifer
Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report
Baseline Human Health Risk Assessment
Former Thompson Industries Site
Madison, Florida

Scenario Timeframe:	Future
Receptor Population:	Industrial Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Subsurface Soil	Subsurface Soil	Exposed Subsurface Soil	*VOCs*					*VOCs*					
			Naphthalene	—		—	—	Naphthalene	body weight	0.0005		0.0005	0.001
			Inorganics					*Inorganics*					
			Aluminum	—		—	—	Aluminum	CNS	0.03		0.003	0.03
			Arsenic	3.97E-07		3.97E-08	4.37E-07	Arsenic	skin	0.002		0.0002	0.003
			Barium	—		—	—	Barium	kidney	0.0005		0.0006	0.001
			Chromium	—		—	—	Chromium	none	0.02		0.09	0.1
			Copper	—		—	—	Copper	gastrointestinal	0.003		0.0003	0.003
			Iron	—		—	—	Iron	liver	0.009		0.0009	0.01
			Vanadium	—		—	—	Vanadium	ND	0.001		0.005	0.007
			(Total)	3.97E-07	NA	3.97E-08	4.37E-07	(Total)		0.07	NA	0.1	0.2
	Air	Particulates from Exposed Subsurface Soil	*Inorganics*					*Inorganics*					
			Aluminum		—		—	Aluminum	ND		0.009		0.009
			Arsenic		1.29E-09		1.29E-09	Arsenic	NA		—		—
			Barium		—		—	Barium	NA		—		—
			Chromium		3.20E-07		3.20E-07	Chromium	lungs		0.0007		0.0007
			Copper		—		—	Copper	NA		—		—
			Iron		—		—	Iron	NA		—		—
			Vanadium		—		—	Vanadium	NA		—		—
			(Total)	NA	3.21E-07	NA	3.21E-07	(Total)		NA	0.01	NA	0.01
	Air	Vapors from Exposed Subsurface Soil	*VOCs*					*VOCs*					
			Naphthalene		—		—	Naphthalene	nose		0.1		0.1
			(Total)	NA	0.00E+00	NA	0.00E+00	(Total)		NA	0.1	NA	0.1

Table 6-7
Summary of Receptor Risks and Hazards For COPCs
Reasonable Maximum Exposure
Future Industrial Worker — Subsurface Soil (Exposed Soil Only) and Groundwater — On-Site Surficial Aquifer
Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report
Baseline Human Health Risk Assessment
Former Thompson Industries Site
Madison, Florida

Scenario Timeframe:	Future
Receptor Population:	Industrial Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Groundwater	Groundwater On-Site Surficial Aquifer	*VOCs*					*VOCs*					
			1,1-Dichloroethene	—		—	—	1,1-Dichloroethene	liver	0.0004		0.0000005	0.0004
			1,4-Dichlorobenzene	3.69E-07		1.54E-09	3.71E-07	1,4-Dichlorobenzene	ND	0.001		0.000006	0.001
			Benzene	8.94E-07		1.26E-09	8.95E-07	Benzene	ND	0.02		0.00002	0.02
			Chloroform	—		—	—	Chloroform	liver	0.0003		0.0000002	0.0003
			cis-1,2-Dichloroethene	—		—	—	cis-1,2-Dichloroethene	blood	0.8		0.0005	0.8
			Naphthalene	—		—	—	Naphthalene	body weight	0.002		0.000008	0.002
			Toluene	—		—	—	Toluene	liver/kidney	0.001		0.000003	0.001
			trans-1,2-Dichloroethene	—		—	—	trans-1,2-Dichloroethene	blood	0.002		0.0000007	0.002
			Trichloroethene	1.09E-03		1.17E-06	1.09E-03	Trichloroethene	liver/kidney	25		0.03	25
			Vinyl chloride (Chloroethene	4.51E-03		2.21E-06	4.51E-03	Vinyl chloride (Chloroethene	liver	3		0.001	3
			Inorganics					*Inorganics*					
			Iron	—		—	—	Iron	liver	0.6		0.00006	0.6
			Manganese	—		—	—	Manganese	CNS	0.4		0.001	0.4
			Pesticides					*Pesticides*					
			beta-BHC	2.09E-07		2.65E-10	2.10E-07	beta-BHC	liver/kidney	0.001		0.000001	0.001
			Heptachlor	2.83E-07		2.09E-10	2.83E-07	Heptachlor	liver	0.0004		0.0000003	0.0004
			(Total)	5.60E-03	NA	3.39E-06	5.60E-03	(Total)		30	NA	0.03	30
							Total Risk Across Exposed Subsurface Soil						Total Hazard Index Across Exposed Subsurface Soil
							7.58E-07						0.3
							Total Risk Across Groundwater — On-Site Surficial Aquifer						*Total Hazard Index Across Groundwater — On-Site Surficial Aquifer*
							5.60E-03						30
							Total Risk Across All Media and All Exposure Routes						Total Hazard Index Across All Media and All Exposure Routes
							5.61E-03						31

NA - Not Applicable
ND - No Data
CNS - Central Nervous System

Target Organ HI per Medium

Organ	Soil	Sediment	Surface Water	Groundwater		
blood	NA	NA	NA	0.8	Total blood HI	0.8
body weight	0.001	NA	NA	0.002	Total body weight HI	0.003
CNS	0.03	NA	NA	0.4	Total CNS HI	0.5
eye	NA	NA	NA	NA	Total eye HI	NA
gastrointestinal	0.003	NA	NA	NA	Total gastrointestinal HI	0.003
kidney	0.001	NA	NA	25	Total kidney HI	25
liver	0.01	NA	NA	29	Total liver HI	29
lungs	0.0007	NA	NA	NA	Total lungs HI	0.0007
nose	0.1	NA	NA	NA	Total nose HI	0.1
skin	0.003	NA	NA	NA	Total skin HI	0.003
thyroid	NA	NA	NA	NA	Total thyroid HI	NA
none/ND	0.1	NA	NA	0.02	Total none/ND HI	0.1

Table 6-8
Summary of Receptor Risks and Hazards For COPCs
Reasonable Maximum Exposure
Future Industrial Worker — Subsurface Soil and Groundwater — On-Site Surficial Aquifer
Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report
Baseline Human Health Risk Assessment
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Madison, Florida

Scenario Timeframe:	Future
Receptor Population:	Industrial Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Subsurface Soil	Subsurface Soil	Subsurface Soil	*VOCs*					*VOCs*					
			2-Methylnaphthalene	—		—	—	2-Methylnaphthalene	body weight	0.00008		0.00008	0.0002
			cis-1,2-Dichloroethene	—		—	—	cis-1,2-Dichloroethene	blood	0.00005		0.00005	0.0001
			Naphthalene	—		—	—	Naphthalene	body weight	0.0003		0.0003	0.0005
			Vinyl chloride (Chloroethene	6.91E-08		6.91E-08	1.38E-07	Vinyl chloride (Chloroethene	liver	0.00005		0.00005	0.00009
			Xylenes (total)	—		—	—	Xylenes (total)	CNS	0.000003		0.000003	0.000006
			SVOCs					*SVOCs*					
			Benzo(a)pyrene	1.40E-07		1.40E-07	2.81E-07	Benzo(a)pyrene	NA	—		—	—
			bis(2-Ethylhexyl)phthalate	8.82E-09		8.82E-09	1.76E-08	bis(2-Ethylhexyl)phthalate	liver	0.00009		0.00009	0.0002
			Inorganics					*Inorganics*					
			Aluminum	—		—	—	Aluminum	CNS	0.003		0.0003	0.004
			Antimony	—		—	—	Antimony	blood	0.0006		0.0004	0.0009
			Arsenic	3.60E-07		3.60E-08	3.96E-07	Arsenic	skin	0.002		0.0002	0.002
			Barium	—		—	—	Barium	kidney	0.0003		0.0005	0.0008
			Chromium	—		—	—	Chromium	none	0.02		0.07	0.08
			Copper	—		—	—	Copper	gastrointestinal	0.0009		0.00009	0.001
			Iron	—		—	—	Iron	liver	0.01		0.001	0.01
			Lead	—		—	—	Lead	NA	—		—	—
			Manganese	—		—	—	Manganese	CNS	0.002		0.004	0.006
			Nickel	—		—	—	Nickel	body weight	0.0005		0.001	0.002
			Thallium	—		—	—	Thallium	blood	0.003		0.0003	0.003
			Vanadium	—		—	—	Vanadium	ND	0.0007		0.003	0.004
			Zinc	—		—	—	Zinc	blood	0.001		0.0001	0.001
			Pesticides					*Pesticides*					
			4,4'-DDT	1.15E-08		1.15E-08	2.30E-08	4,4'-DDT	liver	0.0002		0.0002	0.0004
			PCBs					*PCBs*					
			Aroclor 1260	6.99E-08		6.99E-08	1.40E-07	Aroclor 1260	eye	0.005		0.005	0.01
			(Total)	6.60E-07	NA	3.36E-07	9.95E-07	(Total)		0.05	NA	0.08	0.1

Table 6-8
Summary of Receptor Risks and Hazards For COPCs
Reasonable Maximum Exposure
Future Industrial Worker — Subsurface Soil and Groundwater — On-Site Surficial Aquifer
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Scenario Timeframe:	Future
Receptor Population:	Industrial Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Subsurface Soil	Air	Particulates from Subsurface Soil	SVOCs					SVOCs					
			Benzo(a)pyrene		1.92E-11		1.92E-11	Benzo(a)pyrene	NA		—		—
			bis(2-Ethylhexyl)phthalate		2.85E-12		2.85E-12	bis(2-Ethylhexyl)phthalate	NA		—		—
			Inorganics					Inorganics					
			Aluminum		—		—	Aluminum	ND		0.001		0.001
			Antimony		—		—	Antimony	NA		—		—
			Arsenic		1.17E-09		1.17E-09	Arsenic	NA		—		—
			Barium		—		—	Barium	NA		—		—
			Chromium		2.45E-07		2.45E-07	Chromium	lungs		0.0006		0.0006
			Copper		—		—	Copper	NA		—		—
			Iron		—		—	Iron	NA		—		—
			Lead		—		—	Lead	NA		—		—
			Manganese		—		—	Manganese	CNS		0.0009		0.0009
			Nickel		—		—	Nickel	NA		—		—
			Thallium		—		—	Thallium	NA		—		—
			Vanadium		—		—	Vanadium	NA		—		—
			Zinc		—		—	Zinc	NA		—		—
			Pesticides					Pesticides					
			4,4'-DDT		3.72E-12		3.72E-12	4,4'-DDT	NA		—		—
			PCBs					PCBs					
			Aroclor 1260		2.25E-11		2.25E-11	Aroclor 1260	NA		—		—
			(Total)	NA	2.46E-07	NA	2.46E-07	(Total)		NA	0.003	NA	0.003
	Air	Vapors from Subsurface Soil	VOCs					VOCs					
			2-Methylnaphthalene		—		—	2-Methylnaphthalene	nose		0.01		0.01
			cis-1,2-Dichloroethene		—		—	cis-1,2-Dichloroethene	NA		—		—
			Naphthalene		—		—	Naphthalene	nose		0.05		0.05
			Vinyl chloride (Chloroethene)		6.84E-07		6.84E-07	Vinyl chloride (Chloroethene)	liver		0.002		0.002
			Xylenes (total)		—		—	Xylenes (total)	NA		—		—
			(Total)	NA	6.84E-07	NA	6.84E-07	(Total)		NA	0.07	NA	0.07

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Table 6-8
Summary of Receptor Risks and Hazards For COPCs
Reasonable Maximum Exposure
Future Industrial Worker — Subsurface Soil and Groundwater — On-Site Surficial Aquifer
Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report
Baseline Human Health Risk Assessment
Former Thompson Industries Site
Madison, Florida

Scenario Timeframe:	Future
Receptor Population:	Industrial Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Groundwater	Groundwater On-Site Surficial Aquifer	*VOCs*					*VOCs*					
			1,1-Dichloroethene	—		—	—	1,1-Dichloroethene	liver	0.0004		0.0000005	0.0004
			1,4-Dichlorobenzene	3.69E-07		1.54E-09	3.71E-07	1,4-Dichlorobenzene	ND	0.001		0.000006	0.001
			Benzene	8.94E-07		1.26E-09	8.95E-07	Benzene	ND	0.02		0.00002	0.02
			Chloroform	—		—	—	Chloroform	liver	0.0003		0.0000002	0.0003
			cis-1,2-Dichloroethene	—		—	—	cis-1,2-Dichloroethene	blood	0.8		0.0005	0.8
			Naphthalene	—		—	—	Naphthalene	body weight	0.002		0.000008	0.002
			Toluene	—		—	—	Toluene	liver/kidney	0.001		0.0000003	0.001
			trans-1,2-Dichloroethene	—		—	—	trans-1,2-Dichloroethene	blood	0.002		0.0000007	0.002
			Trichloroethene	1.09E-03		1.17E-06	1.09E-03	Trichloroethene	liver/kidney	25		0.03	25
			Vinyl chloride (Chloroethene	4.51E-03		2.21E-06	4.51E-03	Vinyl chloride (Chloroethene	liver	3		0.001	3
			Inorganics					*Inorganics*					
			Iron	—		—	—	Iron	liver	0.6		0.00006	0.6
			Manganese	—		—	—	Manganese	CNS	0.4		0.001	0.4
			Pesticides					*Pesticides*					
			beta-BHC	2.09E-07		2.65E-10	2.10E-07	beta-BHC	liver/kidney	0.001		0.000001	0.001
			Heptachlor	2.83E-07		2.09E-10	2.83E-07	Heptachlor	liver	0.0004		0.0000003	0.0004
			(Total)	5.60E-03	NA	3.39E-06	5.60E-03	(Total)		30	NA	0.03	30
						Total Risk Across Subsurface Soil	1.92E-06					Total Hazard Index Across Subsurface Soil	0.2
						Total Risk Across Groundwater — On-Site Surficial Aquifer	5.60E-03					Total Hazard Index Across Groundwater — On-Site Surficial Aquifer	30
						Total Risk Across All Media and All Exposure Routes	5.61E-03					Total Hazard Index Across All Media and All Exposure Routes	31

NA - Not Applicable
ND - No Data
CNS - Central Nervous System

Target Organ HI per Medium

Organ	Soil	Sediment	Surface Water	Groundwater		
blood	0.006	NA	NA	0.8	Total blood HI	0.8
body weight	0.003	NA	NA	0.002	Total body weight HI	0.004
CNS	0.01	NA	NA	0.4	Total CNS HI	0.4
eye	0.01	NA	NA	NA	Total eye HI	0.01
gastrointestinal	0.001	NA	NA	NA	Total gastrointestinal HI	0.001
kidney	0.0008	NA	NA	25	Total kidney HI	25
liver	0.01	NA	NA	29	Total liver HI	29
lungs	0.0006	NA	NA	NA	Total lungs HI	0.0006
nose	0.07	NA	NA	NA	Total nose HI	0.07
skin	0.002	NA	NA	NA	Total skin HI	0.002
thyroid	NA	NA	NA	NA	Total thyroid HI	NA
none/ND	0.09	NA	NA	0.02	Total none/ND HI	0.1

Table 6-9
Summary of Receptor Risks and Hazards for COPCs
Reasonable Maximum Exposure
Future Resident Adolescent — Sediment and Surface Water — Unnamed Natural Pond
Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report
Baseline Human Health Risk Assessment
Former Thompson Industries Site
Madison, Florida

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Adolescent

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Sediment	Sediment	Sediment	*SVOCs*					*SVOCs*					
		Unnamed	Benzo(a)pyrene	2.48E-07		8.23E-08	3.30E-07	Benzo(a)pyrene	NA	—		—	—
		Natural Pond	Benzo(b)fluoranthene	4.13E-08		1.37E-08	5.50E-08	Benzo(b)fluoranthene	NA	—		—	—
			Indeno(1,2,3-cd)pyrene	2.13E-08		7.07E-09	2.83E-08	Indeno(1,2,3-cd)pyrene	NA	—		—	—
			Inorganics					*Inorganics*					
			Aluminum	—		—	—	Aluminum	CNS	0.005		0.0002	0.006
			Arsenic	3.93E-07		1.31E-08	4.06E-07	Arsenic	skin	0.006		0.0002	0.006
			Barium	—		—	—	Barium	kidney	0.001		0.0005	0.002
			Cadmium	—		—	—	Cadmium	none	0.001		0.001	0.002
			Chromium	—		—	—	Chromium	none	0.2		0.2	0.4
			Iron	—		—	—	Iron	liver	0.01		0.0005	0.02
			Vanadium	—		—	—	Vanadium	ND	0.002		0.003	0.005
			(Total)	7.03E-07	NA	1.16E-07	8.19E-07	(Total)		0.2	NA	0.2	0.5
Surface Water	Surface Water	Surface Water	*Inorganics*					*Inorganics*					
		Unnamed	Chromium	—		—	—	Chromium	none	0.0091		0.003	0.003
		Natural Pond	Iron	—		—	—	Iron	liver	0.002		0.0008	0.003
			Manganese	—		—	—	Manganese	CNS	0.0007		0.009	0.009
			Pesticides					*Pesticides*					
			4,4'-DDD	5.43E-10		5.05E-08	5.11E-08	4,4'-DDD	liver	0.00003		0.003	0.003
			4,4'-DDE	1.67E-10		1.33E-08	1.35E-08	4,4'-DDE	liver	0.000007		0.0005	0.0006
			4,4'-DDT	1.51E-09		2.16E-07	2.17E-07	4,4'-DDT	liver	0.00006		0.009	0.009
			alpha-Chlordane	7.00E-11		1.21E-09	1.28E-09	alpha-Chlordane	liver	0.000003		0.00005	0.00005
			beta-BHC	3.13E-10		1.96E-09	2.27E-09	beta-BHC	liver/kidney	0.000004		0.00003	0.00003
			gamma-Chlordane	5.78E-11		1.00E-09	1.06E-09	gamma-Chlordane	liver	0.000002		0.00004	0.00004
			(Total)	2.65E-09	NA	2.84E-07	2.86E-07	(Total)		0.003	NA	0.02	0.03

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Table 6-9
Summary of Receptor Risks and Hazards for COPCs
Reasonable Maximum Exposure
Future Resident Adolescent — Sediment and Surface Water — Unnamed Natural Pond
Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report
Baseline Human Health Risk Assessment
Former Thompson Industries Site
Madison, Florida

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Adolescent

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
						Total Risk Across Sediment - Unnamed Natural Pond	8.19E-07					Total Hazard Index Across Sediment - Unnamed Natural Pond	0.5
						Total Risk Across Surface Water - Unnamed Natural Pond	2.86E-07					Total Hazard Index Across Surface Water - Unnamed Natural Pond	0.03
						Total Risk Across All Media and All Exposure Routes	1.11E-06					Total Hazard Index Across All Media and All Exposure Routes	0.5

NA - Not Applicable
ND - No Data
CNS - Central Nervous System

Target Organ HI per Medium

Organ	Soil	Sediment	Surface Water	Groundwater	
blood	NA	NA	NA	NA	Total blood HI: NA
body weight	NA	NA	NA	NA	Total body weight HI: NA
CNS	NA	0.006	0.009	NA	Total CNS HI: 0.02
eye	NA	NA	NA	NA	Total eye HI: NA
gastrointestinal	NA	NA	NA	NA	Total gastrointestinal HI: NA
kidney	NA	0.002	0.00003	NA	Total kidney HI: 0.002
liver	NA	0.02	0.02	NA	Total liver HI: 0.03
lungs	NA	NA	NA	NA	Total lungs HI: NA
nose	NA	NA	NA	NA	Total nose HI: NA
skin	NA	0.006	NA	NA	Total skin HI: 0.006
thyroid	NA	NA	NA	NA	Total thyroid HI: NA
none/ND	NA	0.4	0.003	NA	Total none/ND HI: 0.4

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Table 6-10
Summary of Receptor Risks and Hazards For COPCs
Reasonable Maximum Exposure
Future Resident Adult — Surface Soil (Exposed Soil Only), Sediment and Surface Water — Mill Pond, and Groundwater — On-Site Surficial Aquifer
Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report
Baseline Human Health Risk Assessment
Former Thompson Industries Site
Madison, Florida

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	Exposed Surface Soil	*VOCs*					*VOCs*					
			Naphthalene	—		—	—	Naphthalene	body weight	0.004		0.0008	0.004
			Inorganics					*Inorganics*					
			Aluminum	—		—	—	Aluminum	CNS	0.5		0.01	0.6
			Arsenic	6.11E-06		1.31E-07	6.24E-06	Arsenic	skin	0.03		0.0007	0.03
			Barium	—		—	—	Barium	kidney	0.004		0.001	0.005
			Chromium	—		—	—	Chromium	none	0.2		0.1	0.3
			Copper	—		—	—	Copper	gastrointestinal	0.02		0.0005	0.02
			Iron	—		—	—	Iron	liver	0.1		0.003	0.1
			Vanadium	—		—	—	Vanadium	ND	0.01		0.01	0.02
			(Total)	6.11E-06	NA	1.31E-07	6.24E-06	(Total)		0.9	NA	0.2	1
	Air	Particulates from Exposed Surface Soil	*Inorganics*					*Inorganics*					
			Aluminum		—		—	Aluminum	ND		0.03		0.03
			Arsenic		3.80E-09		3.80E-09	Arsenic	NA		—		—
			Barium		—		—	Barium	NA		—		—
			Chromium		5.49E-07		5.49E-07	Chromium	lungs		0.001		0.001
			Copper		—		—	Copper	NA		—		—
			Iron		—		—	Iron	NA		—		—
			Vanadium		—		—	Vanadium	NA		—		—
			(Total)	NA	5.53E-07	NA	5.53E-07	(Total)		NA	0.03	NA	0.03
	Air	Vapors from Exposed Surface Soil	*VOCs*					*VOCs*					
			Naphthalene		—		—	Naphthalene	none		0.1		0.1
			(Total)	NA	0.00E+00	NA	0.00E+00	(Total)		NA	0.1	NA	0.1
Sediment	Sediment	Sediment Mill Pond	*Inorganics*					*Inorganics*					
			Vanadium	—		—	—	Vanadium	ND	0.01		0.01	0.03
			(Total)	0.00E+00	NA	0.00E+00	0.00E+00	(Total)		0.01	NA	0.01	0.03
Surface Water	Surface Water	Surface Water Mill Pond	*VOCs*					*VOCs*					
			cis-1,2-Dichloroethene	—		—	—	cis-1,2-Dichloroethene	blood	0.00005		0.00005	0.00009
			Vinyl chloride (Chloroethene)	3.19E-06		2.43E-06	5.62E-06	Vinyl chloride (Chloroethene)	liver	0.002		0.001	0.003
			SVOCs					*SVOCs*					
			bis(2-Ethylhexyl)phthalate	8.67E-08		2.99E-07	3.86E-07	bis(2-Ethylhexyl)phthalate	liver	0.0007		0.002	0.003
			Inorganics					*Inorganics*					
			Iron	—		—	—	Iron	liver	0.002		0.0003	0.002
			Pesticides					*Pesticides*					
			beta-BHC	5.55E-08		1.09E-07	1.64E-07	beta-BHC	liver/kidney	0.0002		0.0005	0.0007
			(Total)	3.33E-06	NA	2.84E-06	6.17E-06	(Total)		0.005	NA	0.005	0.009

Table 6-10
Summary of Receptor Risks and Hazards For COPCs
Reasonable Maximum Exposure
Future Resident Adult — Surface Soil (Exposed Soil Only), Sediment and Surface Water — Mill Pond, and Groundwater — On-Site Surficial Aquifer
Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report
Baseline Human Health Risk Assessment
Former Thompson Industries Site
Madison, Florida

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Water	Animal Tissue	Fish from Mill Pond	*VOCs*					*VOCs*					
			cis-1,2-Dichloroethene	—			—	cis-1,2-Dichloroethene	blood	0.0004			0.0004
			Vinyl chloride (Chloroethene)	1.18E-05			1.18E-05	Vinyl chloride (Chloroethene)	liver	0.007			0.007
			SVOCs					*SVOCs*					
			bis(2-Ethylhexyl)phthalate	7.16E-04			7.16E-04	bis(2-Ethylhexyl)phthalate	liver	6			6
			Inorganics					*Inorganics*					
			Iron	—			—	Iron	liver	2			2
			Pesticides					*Pesticides*					
			beta-BHC	6.64E-05			6.64E-05	beta-BHC	liver/kidney	0.3			0.3
			(Total)	7.94E-04	NA	NA	7.94E-04	(Total)		8	NA	NA	8
Groundwater	Groundwater	Groundwater On-Site Surficial Aquifer	*VOCs*					*VOCs*					
			1,1-Dichloroethene	—		—	—	1,1-Dichloroethene	liver	0.002		—	0.002
			1,4-Dichlorobenzene	1.57E-06		—	1.57E-06	1,4-Dichlorobenzene	ND	0.005		—	0.005
			Benzene	3.80E-06		—	3.80E-06	Benzene	ND	0.05		—	0.05
			Chloroform	—		—	—	Chloroform	liver	0.001		—	0.001
			cis-1,2-Dichloroethene	—		—	—	cis-1,2-Dichloroethene	blood	3		—	3
			Naphthalene	—		—	—	Naphthalene	body weight	0.006		—	0.006
			Toluene	—		—	—	Toluene	liver/kidney	0.004		—	0.004
			trans-1,2-Dichloroethene	—		—	—	trans-1,2-Dichloroethene	blood	0.007		—	0.007
			Trichloroethene	4.64E-03		—	4.64E-03	Trichloroethene	liver/kidney	90		—	90
			Vinyl chloride (Chloroethene)	1.92E-02		—	1.92E-02	Vinyl chloride (Chloroethene)	liver	11		—	11
			Inorganics					*Inorganics*					
			Iron	—		—	—	Iron	liver	2		0.006	2
			Manganese	—		—	—	Manganese	CNS	2		*0.1*	2
			Pesticides					*Pesticides*					
			beta-BHC	8.91E-07		3.02E-08	9.21E-07	beta-BHC	liver/kidney	0.004		0.0001	0.004
			Heptachlor	1.20E-06		2.39E-08	1.23E-06	Heptachlor	liver	0.001		0.00002	0.001
			(Total)	2.38E-02	NA	5.40E-08	2.38E-02	(Total)		108	NA	0.1	108

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Table 6-10
Summary of Receptor Risks and Hazards For COPCs
Reasonable Maximum Exposure
Future Resident Adult — Surface Soil (Exposed Soil Only), Sediment and Surface Water — Mill Pond, and Groundwater — On-Site Surficial Aquifer
Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report
Baseline Human Health Risk Assessment
Former Thompson Industries Site
Madison, Florida

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Air	Groundwater Water Vapors at Showerhead On-Site Surficial Aquifer	*VOCs*					*VOCs*					
			1,1-Dichloroethene		—		—	1,1-Dichloroethene	liver		0.001		0.001
			1,4-Dichlorobenzene		1.44E-06		1.44E-06	1,4-Dichlorobenzene	liver		0.0007		0.0007
			Benzene		1.89E-06		1.89E-06	Benzene	ND		0.09		0.09
			Chloroform		3.98E-07		3.98E-07	Chloroform	ND		0.1		0.1
			cis-1,2-Dichloroethene		—		—	cis-1,2-Dichloroethene	NA		—		—
			Naphthalene		—		—	Naphthalene	nose		0.1		0.1
			Toluene		—		—	Toluene	CNS		0.007		0.007
			trans-1,2-Dichloroethene		—		—	trans-1,2-Dichloroethene	NA		—		—
			Trichloroethene		4.64E-03		4.64E-03	Trichloroethene	NA		—		—
			Vinyl chloride (Chloroethene)		4.22E-04		4.22E-04	Vinyl chloride (Chloroethene)	liver		1		1
			(Total)	NA	5.07E-03	NA	5.07E-03	(Total)		NA	2	NA	2

Total Risk Across Exposed Surface Soil	6.79E-06
Total Risk Across Sediment — Mill Pond	0.00E+00
Total Risk Across Surface Water — Mill Pond	8.00E-04
Total Risk Across Groundwater — On-Site Surficial Aquifer	2.89E-02
Total Risk Across All Media and All Exposure Routes	2.97E-02

Total Hazard Index Across Exposed Surface Soil	1
Total Hazard Index Across Sediment — Mill Pond	0.03
Total Hazard Index Across Surface Water — Mill Pond	8
Total Hazard Index Across Groundwater — On-Site Surficial Aquifer	109
Total Hazard Index Across All Media and All Exposure Routes	119

NA - Not Applicable
ND - No Data
CNS - Central Nervous System

Target Organ HI per Medium

Organ	Soil	Sediment	Surface Water	Groundwater		
blood	NA	NA	0.0005	3	Total blood HI	3
body weight	0.004	NA	NA	0.006	Total body weight HI	0.01
CNS	0.6	NA	NA	2	Total CNS HI	2
eye	NA	NA	NA	NA	Total eye HI	NA
gastrointestinal	0.02	NA	NA	NA	Total gastrointestinal HI	0.02
kidney	0.005	NA	0.3	90	Total kidney HI	91
liver	0.1	NA	8	104	Total liver HI	113
lungs	0.001	NA	NA	NA	Total lungs HI	0.001
nose	0.1	NA	NA	0.1	Total nose HI	0.3
skin	0.03	NA	NA	NA	Total skin HI	0.03
thyroid	NA	NA	NA	NA	Total thyroid HI	NA
none/ND	0.4	0.03	NA	0.3	Total none/ND HI	0.7

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Table 6-11
Summary of Receptor Risks and Hazards For COPCs
Reasonable Maximum Exposure
Future Resident Adult — Surface Soil, Sediment and Surface Water — Mill Pond, and Groundwater — On-Site Surficial Aquifer
Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report
Baseline Human Health Risk Assessment
Former Thompson Industries Site
Madison, Florida

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	Surface Soil	*VOCs*					*VOCs*					
			2-Methylnaphthalene	—		—	—	2-Methylnaphthalene	body weight	0.001		0.0002	0.001
			Naphthalene	—		—	—	Naphthalene	body weight	0.007		0.002	0.009
			Xylenes (total)	—		—	—	Xylenes (total)	CNS	0.00003		0.000006	0.00003
			SVOCs					*SVOCs*					
			Benzo(a)pyrene	1.26E-06		2.69E-07	1.53E-06	Benzo(a)pyrene	NA	—		—	—
			bis(2-Ethylhexyl)phthalate	1.88E-07		4.03E-08	2.28E-07	bis(2-Ethylhexyl)phthalate	liver	0.002		0.0003	0.002
			Inorganics					*Inorganics*					
			Aluminum	—		—	—	Aluminum	CNS	0.03		0.0007	0.04
			Arsenic	4.44E-06		9.51E-08	4.54E-06	Arsenic	skin	0.02		0.0005	0.02
			Barium	—		—	—	Barium	kidney	0.003		0.0008	0.004
			Chromium	—		—	—	Chromium	none	0.3		0.3	0.6
			Copper	—		—	—	Copper	gastrointestinal	0.02		0.0004	0.02
			Iron	—		—	—	Iron	liver	0.1		0.002	0.1
			Lead	—		—	—	Lead	NA	—		—	—
			Manganese	—		—	—	Manganese	CNS	0.02		0.008	0.02
			Nickel	—		—	—	Nickel	body weight	0.01		0.005	0.01
			Thallium	—		—	—	Thallium	blood	0.03		0.0006	0.03
			Vanadium	—		—	—	Vanadium	ND	0.007		0.006	0.01
			Zinc	—		—	—	Zinc	blood	0.02		0.0004	0.02
			Pesticides					*Pesticides*					
			4,4'-DDT	6.68E-07		1.43E-07	8.11E-07	4,4'-DDT	liver	0.009		0.002	0.01
			PCBs					*PCBs*					
			Aroclor 1260	1.04E-06		2.23E-07	1.27E-06	Aroclor 1260	eye	0.06		0.01	0.07
			(Total)	7.60E-06	NA	7.71E-07	8.37E-06	(Total)		0.7	NA	0.3	1

Table 6-11
Summary of Receptor Risks and Hazards For COPCs
Reasonable Maximum Exposure
Future Resident Adult — Surface Soil, Sediment and Surface Water — Mill Pond, and Groundwater — On-Site Surficial Aquifer
Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report
Baseline Human Health Risk Assessment
Former Thompson Industries Site
Madison, Florida

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Air	Particulates from Surface Soil	*SVOCs*					*SVOCs*					
			Benzo(a)pyrene		3.30E-11		3.30E-11	Benzo(a)pyrene	NA		—		—
			bis(2-Ethylhexyl)phthalate		1.16E-11		1.16E-11	bis(2-Ethylhexyl)phthalate	NA		—		—
			Inorganics					*Inorganics*					
			Aluminum		—		—	Aluminum	ND		0.002		0.002
			Arsenic		2.77E-09		2.77E-09	Arsenic	NA		—		—
			Barium		—		—	Barium	NA		—		—
			Chromium		1.01E-06		1.01E-06	Chromium	lungs		0.002		0.002
			Copper		—		—	Copper	NA		—		—
			Iron		—		—	Iron	NA		—		—
			Lead		—		—	Lead	NA		—		—
			Manganese		—		—	Manganese	CNS		0.002		0.002
			Nickel		—		—	Nickel	NA		—		—
			Thallium		—		—	Thallium	NA		—		—
			Vanadium		—		—	Vanadium	NA		—		—
			Zinc		—		—	Zinc	NA		—		—
			Pesticides					*Pesticides*					
			4,4'-DDT		4.13E-11		4.13E-11	4,4'-DDT	NA		—		—
			PCBs					*PCBs*					
			Aroclor 1260 (Total)	NA	6.46E-11 1.01E-06	NA	6.46E-11 1.01E-06	Aroclor 1260 (Total)	NA	NA	— 0.006	NA	— 0.006
	Air	Vapors from Surface Soil	*VOCs*					*VOCs*					
			2-Methylnaphthalene		—		—	2-Methylnaphthalene	nose		0.04		0.04
			Naphthalene		—		—	Naphthalene	nose		0.3		0.3
			Xylenes (total) (Total)	NA	— 0.00E+00	NA	— 0.00E+00	Xylenes (total) (Total)	NA	NA	— 0.3	NA	— 0.3

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Table 6-11
Summary of Receptor Risks and Hazards For COPCs
Reasonable Maximum Exposure
Future Resident Adult — Surface Soil, Sediment and Surface Water — Mill Pond, and Groundwater — On-Site Surficial Aquifer
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Former Thompson Industries Site
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Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Sediment	Sediment	Sediment Mill Pond	*Inorganics*					*Inorganics*					
			Vanadium	—		—	—	Vanadium	ND	0.01		0.01	0.03
			(Total)	0.00E+00	NA	0.00E+00	0.00E+00	(Total)		0.01	NA	0.01	0.03
Surface Water	Surface Water	Surface Water Mill Pond	*VOCs*					*VOCs*					
			cis-1,2-Dichloroethene	—		—	—	cis-1,2-Dichloroethene	blood	0.00005		0.00005	0.00009
			Vinyl chloride (Chloroethene)	3.19E-06		2.43E-06	5.62E-06	Vinyl chloride (Chloroethene)	liver	0.002		0.001	0.003
			SVOCs					*SVOCs*					
			bis(2-Ethylhexyl)phthalate	8.67E-08		2.99E-07	3.86E-07	bis(2-Ethylhexyl)phthalate	liver	0.0007		0.002	0.003
			Inorganics					*Inorganics*					
			Iron	—		—	—	Iron	liver	0.002		0.0003	0.002
			Pesticides					*Pesticides*					
			beta-BHC	5.55E-08		1.09E-07	1.64E-07	beta-BHC	liver/kidney	0.0002		0.0005	0.0007
			(Total)	3.33E-06	NA	2.84E-06	6.17E-06	(Total)		0.005	NA	0.005	0.009
	Animal Tissue	Fish from Mill Pond	*VOCs*					*VOCs*					
			cis-1,2-Dichloroethene	—			—	cis-1,2-Dichloroethene	blood	0.0004			0.0004
			Vinyl chloride (Chloroethene)	1.18E-05			1.18E-05	Vinyl chloride (Chloroethene)	liver	0.007			0.007
			SVOCs					*SVOCs*					
			bis(2-Ethylhexyl)phthalate	7.16E-04			7.16E-04	bis(2-Ethylhexyl)phthalate	liver	6			6
			Inorganics					*Inorganics*					
			Iron	—			—	Iron	liver	2			2
			Pesticides					*Pesticides*					
			beta-BHC	6.64E-05			6.64E-05	beta-BHC	liver/kidney	0.3			0.3
			(Total)	7.94E-04	NA	NA	7.94E-04	(Total)		8	NA	NA	8

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Table 6-11
Summary of Receptor Risks and Hazards For COPCs
Reasonable Maximum Exposure
Future Resident Adult — Surface Soil, Sediment and Surface Water — Mill Pond, and Groundwater — On-Site Surficial Aquifer
Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report
Baseline Human Health Risk Assessment
Former Thompson Industries Site
Madison, Florida

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Groundwater	Groundwater On-Site Surficial Aquifer	*VOCs*					*VOCs*					
			1,1-Dichloroethene	—		—	—	1,1-Dichloroethene	liver	0.002		—	0.002
			1,4-Dichlorobenzene	1.57E-06		—	1.57E-06	1,4-Dichlorobenzene	ND	0.005		—	0.005
			Benzene	3.80E-06		—	3.80E-06	Benzene	ND	0.05		—	0.05
			Chloroform	—		—	—	Chloroform	liver	0.001		—	0.001
			cis-1,2-Dichloroethene	—		—	—	cis-1,2-Dichloroethene	blood	3		—	3
			Naphthalene	—		—	—	Naphthalene	body weight	0.006		—	0.006
			Toluene	—		—	—	Toluene	liver/kidney	0.004		—	0.004
			trans-1,2-Dichloroethene	—		—	—	trans-1,2-Dichloroethene	blood	0.007		—	0.007
			Trichloroethene	4.64E-03		—	4.64E-03	Trichloroethene	liver/kidney	90		—	90
			Vinyl chloride (Chloroethene)	1.92E-02		—	1.92E-02	Vinyl chloride (Chloroethene)	liver	11		—	11
			Inorganics					*Inorganics*					
			Iron	—		—	—	Iron	liver	2		0.006	2
			Manganese	—		—	—	Manganese	CNS	2		0.1	2
			Pesticides					*Pesticides*					
			beta-BHC	8.91E-07		3.02E-08	9.21E-07	beta-BHC	liver/kidney	0.004		0.0001	0.004
			Heptachlor	1.20E-06		2.39E-08	1.23E-06	Heptachlor	liver	0.001		0.00002	0.001
			(Total)	2.38E-02	NA	5.40E-08	2.38E-02	(Total)		108	NA	0.1	108
	Air	Groundwater Water Vapors at Showerhead On-Site Surficial Aquifer	*VOCs*					*VOCs*					
			1,1-Dichloroethene		—		—	1,1-Dichloroethene	liver		0.001		0.001
			1,4-Dichlorobenzene		1.44E-06		1.44E-06	1,4-Dichlorobenzene	liver		0.0007		0.0007
			Benzene		1.89E-06		1.89E-06	Benzene	ND		0.09		0.09
			Chloroform		3.98E-07		3.98E-07	Chloroform	ND		0.1		0.1
			cis-1,2-Dichloroethene		—		—	cis-1,2-Dichloroethene	NA		—		—
			Naphthalene		—		—	Naphthalene	nose		0.1		0.1
			Toluene		—		—	Toluene	CNS		0.007		0.007
			trans-1,2-Dichloroethene		—		—	trans-1,2-Dichloroethene	NA		—		—
			Trichloroethene		4.64E-03		4.64E-03	Trichloroethene	NA		—		—
			Vinyl chloride (Chloroethene)		4.22E-04		4.22E-04	Vinyl chloride (Chloroethene)	liver		1		1
			(Total)	NA	5.07E-03	NA	5.07E-03	(Total)		NA	2	NA	2

Table 6-11
Summary of Receptor Risks and Hazards For COPCs
Reasonable Maximum Exposure
Future Resident Adult — Surface Soil, Sediment and Surface Water — Mill Pond, and Groundwater — On-Site Surficial Aquifer
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Baseline Human Health Risk Assessment
Former Thompson Industries Site
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Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
						Total Risk Across Surface Soil	9.38E-06					Total Hazard Index Across Surface Soil	1
						Total Risk Across Sediment — Mill Pond	0.00E+00					Total Hazard Index Across Sediment — Mill Pond	0.03
						Total Risk Across Surface Water — Mill Pond	8.00E-04					Total Hazard Index Across Surface Water — Mill Pond	8
						Total Risk Across Groundwater — On-Site Surficial Aquifer	2.89E-02					Total Hazard Index Across Groundwater — On-Site Surficial Aquifer	109
						Total Risk Across All Media and All Exposure Routes	2.97E-02					Total Hazard Index Across All Media and All Exposure Routes	119

NA - Not Applicable
ND - No Data
CNS - Central Nervous System

Target Organ HI per Medium

Organ	Soil	Sediment	Surface Water	Groundwater		
blood	0.05	NA	0.0005	3	Total blood HI	3
body weight	0.03	NA	NA	0.006	Total body weight HI	0.03
CNS	0.06	NA	NA	2	Total CNS HI	2
eye	0.07	NA	NA	NA	Total eye HI	0.07
gastrointestinal	0.02	NA	NA	NA	Total gastrointestinal HI	0.02
kidney	0.004	NA	0.3	90	Total kidney HI	91
liver	0.1	NA	8	104	Total liver HI	113
lungs	0.002	NA	NA	NA	Total lungs HI	0.002
nose	0.3	NA	NA	0.1	Total nose HI	0.5
skin	0.02	NA	NA	NA	Total skin HI	0.02
thyroid	NA	NA	NA	NA	Total thyroid HI	NA
none/ND	0.6	0.03	NA	0.3	Total none/ND HI	0.9

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Table 6-12
Summary of Receptor Risks and Hazards For COPCs
Reasonable Maximum Exposure
Future Resident Adult — Subsurface Soil (Exposed Soil Only), Sediment and Surface Water — Mill Pond, and Groundwater — On-Site Surficial Aquifer
Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report
Baseline Human Health Risk Assessment
Former Thompson Industries Site
Madison, Florida

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Subsurface Soil	Subsurface Soil	Exposed Subsurface Soil	*VOCs*					*VOCs*					
			Naphthalene	—		—	—	Naphthalene	body weight	0.004		0.0008	0.004
			Inorganics					*Inorganics*					
			Aluminum	—		—	—	Aluminum	CNS	0.2		0.004	0.2
			Arsenic	3.56E-06		7.62E-08	3.64E-06	Arsenic	skin	0.02		0.0004	0.02
			Barium	—		—	—	Barium	kidney	0.003		0.001	0.004
			Chromium	—		—	—	Chromium	none	0.2		0.1	0.3
			Copper	—		—	—	Copper	gastrointestinal	0.02		0.0005	0.02
			Iron	—		—	—	Iron	liver	0.07		0.001	0.07
			Vanadium	—		—	—	Vanadium	ND	0.01		0.009	0.02
			(Total)	3.56E-06	NA	7.62E-08	3.64E-06	(Total)		0.5	NA	0.2	0.7
	Air	Particulates from Exposed Subsurface Soil	*Inorganics*					*Inorganics*					
			Aluminum		—		—	Aluminum	ND		0.01		0.01
			Arsenic		2.22E-09		2.22E-09	Arsenic	NA		—		—
			Barium		—		—	Barium	NA		—		—
			Chromium		5.49E-07		5.49E-07	Chromium	hmga		0.001		0.001
			Copper		—		—	Copper	NA		—		—
			Iron		—		—	Iron	NA		—		—
			Vanadium		—		—	Vanadium	NA		—		—
			(Total)	NA	5.51E-07	NA	5.51E-07	(Total)		NA	0.01	NA	0.01
	Air	Vapors from Exposed Subsurface Soil	*VOCs*					*VOCs*					
			Naphthalene		—		—	Naphthalene	nose		0.1		0.1
			(Total)	NA	0.00E+00	NA	0.00E+00	(Total)		NA	0.1	NA	0.1
Sediment	Sediment	Sediment Mill Pond	*Inorganics*					*Inorganics*					
			Vanadium	—		—	—	Vanadium	ND	0.01		0.01	0.03
			(Total)	0.00E+00	NA	0.00E+00	0.00E+00	(Total)		0.01	NA	0.01	0.03
Surface Water	Surface Water	Surface Water Mill Pond	*VOCs*					*VOCs*					
			cis-1,2-Dichloroethene	—		—	—	cis-1,2-Dichloroethene	blood	0.00005		0.00005	0.00009
			Vinyl chloride (Chloroethene)	3.19E-06		2.43E-06	5.62E-06	Vinyl chloride (Chloroethene)	liver	0.002		0.001	0.003
			SVOCs					*SVOCs*					
			bis(2-Ethylhexyl)phthalate	8.67E-08		2.99E-07	3.86E-07	bis(2-Ethylhexyl)phthalate	liver	0.0007		0.002	0.003

Table 6-12
Summary of Receptor Risks and Hazards For COPCs
Reasonable Maximum Exposure
Future Resident Adult — Subsurface Soil (Exposed Soil Only), Sediment and Surface Water — Mill Pond, and Groundwater — On-Site Surficial Aquifer
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Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Water	Surface Water	Surface Water Mill Pond	*Inorganics*					*Inorganics*					
			Iron	—		—	—	Iron	liver	0.002		0.0003	0.002
			Pesticides					*Pesticides*					
			beta-BHC	5.55E-08		1.09E-07	1.64E-07	beta-BHC	liver/kidney	0.0002		0.0005	0.0007
			(Total)	3.33E-06	NA	2.84E-06	6.17E-06	(Total)		0.005	NA	0.005	0.009
	Animal Tissue	Fish from Mill Pond	*VOCs*					*VOCs*					
			cis-1,2-Dichloroethene	—			—	cis-1,2-Dichloroethene	blood	0.0004			0.0004
			Vinyl chloride (Chloroethene)	1.18E-05			1.18E-05	Vinyl chloride (Chloroethene)	liver	0.007			0.007
			SVOCs					*SVOCs*					
			bis(2-Ethylhexyl)phthalate	7.16E-04			7.16E-04	bis(2-Ethylhexyl)phthalate	liver	6			6
			Inorganics					*Inorganics*					
			Iron	—			—	Iron	liver	2			2
			Pesticides					*Pesticides*					
			beta-BHC	6.64E-05			6.64E-05	beta-BHC	liver/kidney	0.3			0.3
			(Total)	7.94E-04	NA	NA	7.94E-04	(Total)		8	NA	NA	8
Groundwater	Groundwater	Groundwater On-Site Surficial Aquifer	*VOCs*					*VOCs*					
			1,1-Dichloroethene	—		—	—	1,1-Dichloroethene	liver	0.002		—	0.002
			1,4-Dichlorobenzene	1.57E-06		—	1.57E-06	1,4-Dichlorobenzene	ND	0.005		—	0.005
			Benzene	3.80E-06		—	3.80E-06	Benzene	ND	0.05		—	0.05
			Chloroform	—		—	—	Chloroform	liver	0.001		—	0.001
			cis-1,2-Dichloroethene	—		—	—	cis-1,2-Dichloroethene	blood	3		—	3
			Naphthalene	—		—	—	Naphthalene	body weight	0.006		—	0.006
			Toluene	—		—	—	Toluene	liver/kidney	0.004		—	0.004
			trans-1,2-Dichloroethene	—		—	—	trans-1,2-Dichloroethene	blood	0.007		—	0.007
			Trichloroethene	4.64E-03		—	4.64E-03	Trichloroethene	liver/kidney	90		—	90
			Vinyl chloride (Chloroethene)	1.92E-02		—	1.92E-02	Vinyl chloride (Chloroethene)	liver	11		—	11

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Table 6-12
Summary of Receptor Risks and Hazards For COPCs
Reasonable Maximum Exposure
Future Resident Adult — Subsurface Soil (Exposed Soil Only), Sediment and Surface Water — Mill Pond, and Groundwater — On-Site Surficial Aquifer
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Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Groundwater	Groundwater On-Site Surficial Aquifer	*Inorganics*					*Inorganics*					
			Iron	—		—	—	Iron	liver	2		0.006	2
			Manganese	—		—	—	Manganese	CNS	2		0.1	2
			Pesticides					*Pesticides*					
			beta-BHC	8.91E-07		3.02E-08	9.21E-07	beta-BHC	liver/kidney	0.004		0.0001	0.004
			Heptachlor	1.20E-06		2.39E-08	1.23E-06	Heptachlor	liver	0.001		0.00002	0.001
			(Total)	2.38E-02	NA	5.40E-08	2.38E-02	(Total)		108	NA	0.1	108
	Air	Groundwater Water Vapors at Showerhead On-Site Surficial Aquifer	*VOCs*					*VOCs*					
			1,1-Dichloroethene		—		—	1,1-Dichloroethene	liver		0.001		0.001
			1,4-Dichlorobenzene		1.44E-06		1.44E-06	1,4-Dichlorobenzene	liver		0.0007		0.0007
			Benzene		1.89E-06		1.89E-06	Benzene	ND		0.09		0.09
			Chloroform		3.98E-07		3.98E-07	Chloroform	ND		0.1		0.1
			cis-1,2-Dichloroethene		—		—	cis-1,2-Dichloroethene	NA		—		—
			Naphthalene		—		—	Naphthalene	nose		0.1		0.1
			Toluene		—		—	Toluene	CNS		0.007		0.007
			trans-1,2-Dichloroethene		—		—	trans-1,2-Dichloroethene	NA		—		—
			Trichloroethene		4.64E-03		4.64E-03	Trichloroethene	NA		—		—
			Vinyl chloride (Chloroethene)		4.22E-04		4.22E-04	Vinyl chloride (Chloroethene)	liver		1		1
			(Total)	NA	5.07E-03	NA	5.07E-03	(Total)		NA	2	NA	2
			Total Risk Across Exposed Subsurface Soil				4.19E-06	Total Hazard Index Across Exposed Subsurface Soil					0.8
			Total Risk Across Sediment — Mill Pond				0.00E+00	Total Hazard Index Across Sediment — Mill Pond					0.03
			Total Risk Across Surface Water — Mill Pond				8.00E-04	Total Hazard Index Across Surface Water — Mill Pond					8
			Total Risk Across Groundwater — On-Site Surficial Aquifer				2.89E-02	Total Hazard Index Across Groundwater — On-Site Surficial Aquifer					109
			Total Risk Across All Media and All Exposure Routes				2.97E-02	Total Hazard Index Across All Media and All Exposure Routes					118

NA - Not Applicable
ND - No Data
CNS - Central Nervous System

Target Organ HI per Medium

Organ	Soil	Sediment	Surface Water	Groundwater	
blood	NA	NA	0.0005	3	Total blood HI 3
body weight	0.004	NA	NA	0.006	Total body weight HI 0.01
CNS	0.2	NA	NA	2	Total CNS HI 2
eye	NA	NA	NA	NA	Total eye HI NA
gastrointestinal	0.02	NA	NA	NA	Total gastrointestinal HI 0.02
kidney	0.004	NA	0.3	90	Total kidney HI 91
liver	0.07	NA	8	104	Total liver HI 113
lungs	0.001	NA	NA	NA	Total lungs HI 0.001
nose	0.1	NA	NA	0.1	Total nose HI 0.3
skin	0.02	NA	NA	NA	Total skin HI 0.02
thyroid	NA	NA	NA	NA	Total thyroid HI NA
none/ND	0.3	0.03	NA	0.3	Total none/ND HI 0.7

Table 6-13
Summary of Receptor Risks and Hazards For COPCs
Reasonable Maximum Exposure
Future Resident Adult — Subsurface Soil, Sediment and Surface Water — Mill Pond, and Groundwater — On-Site Surficial Aquifer
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Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Subsurface Soil	Subsurface Soil	Subsurface Soil	*VOCs*					*VOCs*					
			2-Methylnaphthalene	—		—	—	2-Methylnaphthalene	body weight	0.0006		0.0001	0.0007
			cis-1,2-Dichloroethene	—		—	—	cis-1,2-Dichloroethene	blood	0.0004		0.00008	0.0005
			Naphthalene	—		—	—	Naphthalene	body weight	0.002		0.0004	0.002
			Vinyl chloride (Chloroethene)	6.20E-07		1.33E-07	7.52E-07	Vinyl chloride (Chloroethene)	liver	0.0003		0.00007	0.0004
			Xylenes (total)	—		—	—	Xylenes (total)	CNS	0.00002		0.000005	0.00003
			SVOCs					*SVOCs*					
			Benzo(a)pyrene	1.36E-06		2.69E-07	1.53E-06	Benzo(a)pyrene	NA	—		—	—
			bis(2-Ethylhexyl)phthalate	7.90E-08		1.69E-08	9.60E-08	bis(2-Ethylhexyl)phthalate	liver	0.0007		0.0001	0.0008
			Inorganics					*Inorganics*					
			Aluminum	—		—	—	Aluminum	CNS	0.03		0.0005	0.03
			Antimony	—		—	—	Antimony	blood	0.004		0.0006	0.005
			Arsenic	3.22E-06		6.90E-08	3.29E-06	Arsenic	skin	0.02		0.0004	0.02
			Barium	—		—	—	Barium	kidney	0.002		0.0007	0.003
			Chromium	—		—	—	Chromium	none	0.1		0.1	0.2
			Copper	—		—	—	Copper	gastrointestinal	0.007		0.0001	0.007
			Iron	—		—	—	Iron	liver	0.08		0.002	0.08
			Lead	—		—	—	Lead	NA	—		—	—
			Manganese	—		—	—	Manganese	CNS	0.01		0.006	0.02
			Nickel	—		—	—	Nickel	body weight	0.004		0.002	0.006
			Thallium	—		—	—	Thallium	blood	0.02		0.0005	0.02
			Vanadium	—		—	—	Vanadium	ND	0.006		0.005	0.01
			Zinc	—		—	—	Zinc	blood	0.008		0.0002	0.008
			Pesticides					*Pesticides*					
			4,4'-DDT	1.03E-07		2.21E-08	1.25E-07	4,4'-DDT	liver	0.001		0.0003	0.002
			PCBs					*PCBs*					
			Aroclor 1260	6.26E-07		1.34E-07	7.60E-07	Aroclor 1260	eye	0.04		0.008	0.04
			(Total)	5.91E-06	NA	6.44E-07	6.55E-06	(Total)		0.4	NA	0.1	0.5

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Table 6-13
Summary of Receptor Risks and Hazards For COPCs
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Future Resident Adult — Subsurface Soil, Sediment and Surface Water — Mill Pond, and Groundwater — On-Site Surficial Aquifer
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Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Subsurface Soil	Air	Particulates from Subsurface Soil	*SVOCs*					*SVOCs*					
			Benzo(a)pyrene		3.30E-11		3.30E-11	Benzo(a)pyrene	NA		—		—
			bis(2-Ethylhexyl)phthalate		4.89E-12		4.89E-12	bis(2-Ethylhexyl)phthalate	NA		—		—
			Inorganics					*Inorganics*					
			Aluminum		—		—	Aluminum	ND		0.002		0.002
			Antimony		—		—	Antimony	NA		—		—
			Arsenic		2.01E-09		2.01E-09	Arsenic	NA		—		—
			Barium		—		—	Barium	NA		—		—
			Chromium		4.21E-07		4.21E-07	Chromium	lungs		0.0008		0.0008
			Copper		—		—	Copper	NA		—		—
			Iron		—		—	Iron	NA		—		—
			Lead		—		—	Lead	NA		—		—
			Manganese		—		—	Manganese	CNS		0.001		0.001
			Nickel		—		—	Nickel	NA		—		—
			Thallium		—		—	Thallium	NA		—		—
			Vanadium		—		—	Vanadium	NA		—		—
			Zinc		—		—	Zinc	NA		—		—
			Pesticides					*Pesticides*					
			4,4'-DDT		6.39E-12		6.39E-12	4,4'-DDT	NA		—		—
			PCBs					*PCBs*					
			Aroclor 1260		3.87E-11		3.87E-11	Aroclor 1260	NA		—		—
			(Total)	NA	4.23E-07	NA	4.23E-07	(Total)		NA	0.004	NA	0.004
	Air	Vapors from Subsurface Soil	*VOCs*					*VOCs*					
			2-Methylnaphthalene		—		—	2-Methylnaphthalene	nose		0.02		0.02
			cis-1,2-Dichloroethene		—		—	cis-1,2-Dichloroethene	NA		—		—
			Naphthalene		—		—	Naphthalene	nose		0.07		0.07
			Vinyl chloride (Chloroethene)		1.18E-06		1.18E-06	Vinyl chloride (Chloroethene)	liver		0.003		0.003
			Xylenes (total)		—		—	Xylenes (total)	NA		—		—
			(Total)	NA	1.18E-06	NA	1.18E-06	(Total)		NA	0.1	NA	0.1

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Receptor Population:	Resident
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Sediment	Sediment	Sediment Mill Pond	*Inorganics*					*Inorganics*					
			Vanadium	—		—	—	Vanadium	ND	0.01		0.01	0.03
			(Total)	0.00E+00	NA	0.00E+00	0.00E+00	(Total)		0.01	NA	0.01	0.03
Surface Water	Surface Water	Surface Water Mill Pond	*VOCs*					*VOCs*					
			cis-1,2-Dichloroethene	—		—	—	cis-1,2-Dichloroethene	blood	0.00005		0.00005	0.00009
			Vinyl chloride (Chloroethene)	3.19E-06		2.43E-06	5.62E-06	Vinyl chloride (Chloroethene)	liver	0.002		0.001	0.003
			SVOCs					*SVOCs*					
			bis(2-Ethylhexyl)phthalate	8.67E-08		2.99E-07	3.86E-07	bis(2-Ethylhexyl)phthalate	liver	0.0007		0.002	0.003
			Inorganics					*Inorganics*					
			Iron	—		—	—	Iron	liver	0.002		0.0003	0.002
			Pesticides					*Pesticides*					
			beta-BHC	5.55E-08		1.09E-07	1.64E-07	beta-BHC	liver/kidney	0.0002		0.0005	0.0007
			(Total)	3.33E-06	NA	2.84E-06	6.17E-06	(Total)		0.005	NA	0.005	0.009
	Animal Tissue	Fish from Mill Pond	*VOCs*					*VOCs*					
			cis-1,2-Dichloroethene	—			—	cis-1,2-Dichloroethene	blood	0.0004			0.0004
			Vinyl chloride (Chloroethene)	1.18E-05			1.18E-05	Vinyl chloride (Chloroethene)	liver	0.007			0.007
			SVOCs					*SVOCs*					
			bis(2-Ethylhexyl)phthalate	7.16E-04			7.16E-04	bis(2-Ethylhexyl)phthalate	liver	6			6
			Inorganics					*Inorganics*					
			Iron	—			—	Iron	liver	2			2
			Pesticides					*Pesticides*					
			beta-BHC	6.64E-05			6.64E-05	beta-BHC	liver/kidney	0.3			0.3
			(Total)	7.94E-04	NA	NA	7.94E-04	(Total)		8	NA	NA	8

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Table 6-13
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Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Groundwater	Groundwater On-Site Surficial Aquifer	*VOCs*					*VOCs*					
			1,1-Dichloroethene	—		—	—	1,1-Dichloroethene	liver	0.002		—	0.002
			1,4-Dichlorobenzene	1.57E-06		—	1.57E-06	1,4-Dichlorobenzene	ND	0.005		—	0.005
			Benzene	3.80E-06		—	3.80E-06	Benzene	ND	0.05		—	0.05
			Chloroform	—		—	—	Chloroform	liver	0.001		—	0.001
			cis-1,2-Dichloroethene	—		—	—	cis-1,2-Dichloroethene	blood	3		—	3
			Naphthalene	—		—	—	Naphthalene	body weight	0.006		—	0.006
			Toluene	—		—	—	Toluene	liver/kidney	0.004		—	0.004
			trans-1,2-Dichloroethene	—		—	—	trans-1,2-Dichloroethene	blood	0.007		—	0.007
			Trichloroethene	4.64E-03		—	4.64E-03	Trichloroethene	liver/kidney	90		—	90
			Vinyl chloride (Chloroethene)	1.92E-02		—	1.92E-02	Vinyl chloride (Chloroethene)	liver	11		—	11
			Inorganics					*Inorganics*					
			Iron	—		—	—	Iron	liver	2		0.006	2
			Manganese	—		—	—	Manganese	CNS	2		0.1	2
			Pesticides					*Pesticides*					
			beta-BHC	8.91E-07		3.02E-08	9.21E-07	beta-BHC	liver/kidney	0.004		0.0001	0.004
			Heptachlor	1.20E-06		2.39E-08	1.23E-06	Heptachlor	liver	0.001		0.00002	0.001
			(Total)	2.38E-02	NA	5.40E-08	2.38E-02	(Total)		108	NA	0.1	108
	Air	Groundwater Water Vapors at Showerhead On-Site Surficial Aquifer	*VOCs*					*VOCs*					
			1,1-Dichloroethene		—		—	1,1-Dichloroethene	liver		0.001		0.001
			1,4-Dichlorobenzene		1.44E-06		1.44E-06	1,4-Dichlorobenzene	liver		0.0007		0.0007
			Benzene		1.89E-06		1.89E-06	Benzene	ND		0.09		0.09
			Chloroform		3.98E-07		3.98E-07	Chloroform	ND		0.1		0.1
			cis-1,2-Dichloroethene		—		—	cis-1,2-Dichloroethene	NA		—		—
			Naphthalene		—		—	Naphthalene	nose		0.1		0.1
			Toluene		—		—	Toluene	CNS		0.007		0.007
			trans-1,2-Dichloroethene		—		—	trans-1,2-Dichloroethene	NA		—		—
			Trichloroethene		4.64E-03		4.64E-03	Trichloroethene	NA		—		—
			Vinyl chloride (Chloroethene)		4.22E-04		4.22E-04	Vinyl chloride (Chloroethene)	liver		1		1
			(Total)	NA	5.07E-03	NA	5.07E-03	(Total)		NA	2	NA	2

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Table 6-13
Summary of Receptor Risks and Hazards For COPCs
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Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
						Total Risk Across Subsurface Soil	8.15E-06					Total Hazard Index Across Subsurface Soil	0.6
						Total Risk Across Sediment — Mill Pond	0.00E+00					Total Hazard Index Across Sediment — Mill Pond	0.03
						Total Risk Across Surface Water — Mill Pond	8.00E-04					Total Hazard Index Across Surface Water — Mill Pond	8
						Total Risk Across Groundwater — On-Site Surficial Aquifer	2.89E-02					Total Hazard Index Across Groundwater — On-Site Surficial Aquifer	109
						Total Risk Across All Media and All Exposure Routes	2.97E-02					Total Hazard Index Across All Media and All Exposure Routes	118

NA - Not Applicable
ND - No Data
CNS - Central Nervous System

Target Organ HI per Medium

Organ	Soil	Sediment	Surface Water	Groundwater	
blood	0.04	NA	0.0005	3	Total blood HI 3
body weight	0.009	NA	NA	0.006	Total body weight HI 0.02
CNS	0.05	NA	NA	2	Total CNS HI 2
eye	0.04	NA	NA	NA	Total eye HI 0.04
gastrointestinal	0.007	NA	NA	NA	Total gastrointestinal HI 0.007
kidney	0.003	NA	0.3	90	Total kidney HI 91
liver	0.09	NA	8	104	Total liver HI 113
lungs	0.0008	NA	NA	NA	Total lungs HI 0.0008
nose	0.1	NA	NA	0.1	Total nose HI 0.2
skin	0.02	NA	NA	NA	Total skin HI 0.02
thyroid	NA	NA	NA	NA	Total thyroid HI NA
none/ND	0.2	0.03	NA	0.3	Total none/ND HI 0.6

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Table 6-14
Summary of Receptor Risks and Hazards For COPCs
Reasonable Maximum Exposure
Future Resident Adult — Surface Soil (Exposed Soil Only), Sediment and Surface Water — Mill Pond, and Groundwater — Off-Site Surficial Aquifer
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Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	Exposed Surface Soil	*VOCs*					*VOCs*					
			Naphthalene	—		—	—	Naphthalene	body weight	0.004		0.0008	0.004
			Inorganics					*Inorganics*					
			Aluminum	—		—	—	Aluminum	CNS	0.5		0.01	0.6
			Arsenic	6.11E-06		1.31E-07	6.24E-06	Arsenic	skin	0.03		0.0007	0.03
			Barium	—		—	—	Barium	kidney	0.004		0.001	0.005
			Chromium	—		—	—	Chromium	none	0.2		0.1	0.3
			Copper	—		—	—	Copper	gastrointestinal	0.02		0.0005	0.02
			Iron	—		—	—	Iron	liver	0.1		0.003	0.1
			Vanadium	—		—	—	Vanadium	ND	0.01		0.01	0.02
			(Total)	6.11E-06	NA	1.31E-07	6.24E-06	(Total)		0.9	NA	0.2	1
	Air	Particulates from Exposed Surface Soil	*Inorganics*					*Inorganics*					
			Aluminum		—		—	Aluminum	ND		0.03		0.03
			Arsenic		3.80E-09		3.80E-09	Arsenic	NA		—		—
			Barium		—		—	Barium	NA		—		—
			Chromium		5.49E-07		5.49E-07	Chromium	lungs		0.001		0.001
			Copper		—		—	Copper	NA		—		—
			Iron		—		—	Iron	NA		—		—
			Vanadium		—		—	Vanadium	NA		—		—
			(Total)	NA	5.53E-07	NA	5.53E-07	(Total)		NA	0.03	NA	0.03
	Air	Vapors from Exposed Surface Soil	*VOCs*					*VOCs*					
			Naphthalene		—		—	Naphthalene	nose		0.1		0.1
			(Total)	NA	0.00E+00	NA	0.00E+00	(Total)		NA	0.1	NA	0.1
Sediment	Sediment	Sediment Mill Pond	*Inorganics*					*Inorganics*					
			Vanadium	—		—	—	Vanadium	ND	0.01		0.01	0.03
			(Total)	0.00E+00	NA	0.00E+00	0.00E+00	(Total)		0.01	NA	0.01	0.03
Surface Water	Surface Water	Surface Water Mill Pond	*VOCs*					*VOCs*					
			cis-1,2-Dichloroethene	—		—	—	cis-1,2-Dichloroethene	blood	0.00005		0.00005	0.00009
			Vinyl chloride (Chloroethene)	3.19E-06		2.43E-06	5.62E-06	Vinyl chloride (Chloroethene)	liver	0.002		0.001	0.003
			SVOCs					*SVOCs*					
			bis(2-Ethylhexyl)phthalate	8.67E-08		2.99E-07	3.86E-07	bis(2-Ethylhexyl)phthalate	liver	0.0007		0.002	0.003
			Inorganics					*Inorganics*					
			Iron	—		—	—	Iron	liver	0.002		0.0003	0.002
			Pesticides					*Pesticides*					
			beta-BHC	5.55E-08		1.09E-07	1.64E-07	beta-BHC	liver/kidney	0.0002		0.0005	0.0007
			(Total)	3.33E-06	NA	2.84E-06	6.17E-06	(Total)		0.005	NA	0.005	0.009

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Receptor Population:	Resident
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Water	Animal Tissue	Fish from Mill Pond	*VOCs*					*VOCs*					
			cis-1,2-Dichloroethene	—			—	cis-1,2-Dichloroethene	blood	0.0004			0.0004
			Vinyl chloride (Chloroethene)	1.18E-05			1.18E-05	Vinyl chloride (Chloroethene)	liver	0.007			0.007
			SVOCs					*SVOCs*					
			bis(2-Ethylhexyl)phthalate	7.16E-04			7.16E-04	bis(2-Ethylhexyl)phthalate	liver	6			6
			Inorganics					*Inorganics*					
			Iron	—			—	Iron	liver	2			2
			Pesticides					*Pesticides*					
			beta-BHC	6.64E-05			6.64E-05	beta-BHC	liver/kidney	0.3			0.3
			(Total)	7.94E-04	NA	NA	7.94E-04	(Total)		8	NA	NA	8
Groundwater	Groundwater	Groundwater Off-Site Surficial Aquifer	*VOCs*					*VOCs*					
			1,1-Dichloroethene	—		—	—	1,1-Dichloroethene	liver	0.002		—	0.002
			Benzene	7.09E-07		—	7.09E-07	Benzene	ND	0.01		—	0.01
			cis-1,2-Dichloroethene	—		—	—	cis-1,2-Dichloroethene	blood	2		—	2
			Trichloroethene	3.16E-03		—	3.16E-03	Trichloroethene	liver/kidney	61		—	61
			Vinyl chloride (Chloroethene)	6.41E-03		—	6.41E-03	Vinyl chloride (Chloroethene)	liver	4		—	4
			SVOCs					*SVOCs*					
			bis(2-Ethylhexyl)phthalate	3.54E-06		2.10E-07	3.75E-06	bis(2-Ethylhexyl)phthalate	liver	0.03		0.002	0.03
			Inorganics					*Inorganics*					
			Chromium	—		—	—	Chromium	none	0.5		0.06	0.6
			Cyanide, Total	—		—	—	Cyanide, Total	CNS/thyroid/body weight	0.01		0.00004	0.01
			Iron	—		—	—	Iron	liver	0.5		0.001	0.5
			Manganese	—		—	—	Manganese	CNS	0.1		0.009	0.1
			Nickel	—		—	—	Nickel	body weight	0.1		0.008	0.1
			Pesticides					*Pesticides*					
			beta-BHC	6.16E-07		2.08E-08	6.37E-07	beta-BHC	liver/kidney	0.003		0.00009	0.003
			Dieldrin	1.37E-05		3.95E-07	1.41E-05	Dieldrin	liver	0.04		0.001	0.04
			(Total)	9.39E-03	NA	6.26E-07	9.59E-03	(Total)		68	NA	0.08	68

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Receptor Population:	Resident
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Air	Groundwater	VOCs					VOCs					
		Water Vapors	1,1-Dichloroethene		—		—	1,1-Dichloroethene	liver		0.002		0.002
		at Showerhead	Benzene		3.52E-07		3.52E-07	Benzene	ND		0.02		0.02
		Off-Site	cis-1,2-Dichloroethene		—		—	cis-1,2-Dichloroethene	NA		—		—
		Surficial Aquifer	Trichloroethene		3.16E-03		3.16E-03	Trichloroethene	NA		—		—
			Vinyl chloride (Chloroethene)		1.41E-04		1.41E-04	Vinyl chloride (Chloroethene)	liver		0.4		0.4
			(Total)	NA	3.30E-03	NA	3.30E-03	(Total)		NA	0.4	NA	0.4
							Total Risk Across Exposed Surface Soil	6.79E-06					Total Hazard Index Across Exposed Surface Soil	1
							Total Risk Across Sediment — Mill Pond	0.00E+00					Total Hazard Index Across Sediment — Mill Pond	0.03
							Total Risk Across Surface Water — Mill Pond	8.00E-04					Total Hazard Index Across Surface Water — Mill Pond	8
							Total Risk Across Groundwater — Off-Site Surficial Aquifer	1.29E-02					Total Hazard Index Across Groundwater — Off-Site Surficial Aquifer	69
							Total Risk Across All Media and All Exposure Routes	1.37E-02					Total Hazard Index Across All Media and All Exposure Routes	78

NA - Not Applicable
ND - No Data
CNS - Central Nervous System

Target Organ HI per Medium

Organ	Soil	Sediment	Surface Water	Groundwater		
blood	NA	NA	0.0005	2	Total blood HI	2
body weight	0.004	NA	NA	0.1	Total body weight HI	0.1
CNS	0.6	NA	NA	0.2	Total CNS HI	0.7
eye	NA	NA	NA	NA	Total eye HI	NA
gastrointestinal	0.02	NA	NA	NA	Total gastrointestinal HI	0.02
kidney	0.005	NA	0.3	61	Total kidney HI	62
liver	0.1	NA	8	66	Total liver HI	74
lungs	0.001	NA	NA	NA	Total lungs HI	0.001
nose	0.1	NA	NA	NA	Total nose HI	0.1
skin	0.03	NA	NA	NA	Total skin HI	0.03
thyroid	NA	NA	NA	0.01	Total thyroid HI	0.01
none/ND	0.4	0.03	NA	0.6	Total none/ND HI	1

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Table 6-15
Summary of Receptor Risks and Hazards For COPCs
Reasonable Maximum Exposure
Future Resident Adult — Surface Soil, Sediment and Surface Water — Mill Pond, and Groundwater — Off-Site Surficial Aquifer
Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report
Baseline Human Health Risk Assessment
Former Thompson Industries Site
Madison, Florida

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	Surface Soil	*VOCs*					*VOCs*					
			2-Methylnaphthalene	—		—	—	2-Methylnaphthalene	body weight	0.001		0.0002	0.001
			Naphthalene	—		—	—	Naphthalene	body weight	0.007		0.002	0.009
			Xylenes (total)	—		—	—	Xylenes (total)	CNS	0.00003		0.000006	0.00003
			SVOCs					*SVOCs*					
			Benzo(a)pyrene	1.26E-06		2.69E-07	1.53E-06	Benzo(a)pyrene	NA	—		—	—
			bis(2-Ethylhexyl)phthalate	1.88E-07		4.03E-08	2.28E-07	bis(2-Ethylhexyl)phthalate	liver	0.002		0.0003	0.002
			Inorganics					*Inorganics*					
			Aluminum	—		—	—	Aluminum	CNS	0.03		0.0007	0.04
			Arsenic	4.44E-06		9.51E-08	4.54E-06	Arsenic	skin	0.02		0.0005	0.02
			Barium	—		—	—	Barium	kidney	0.003		0.0008	0.004
			Chromium	—		—	—	Chromium	none	0.3		0.3	0.6
			Copper	—		—	—	Copper	gastrointestinal	0.02		0.0004	0.02
			Iron	—		—	—	Iron	liver	0.1		0.002	0.1
			Lead	—		—	—	Lead	NA	—		—	—
			Manganese	—		—	—	Manganese	CNS	0.02		0.008	0.02
			Nickel	—		—	—	Nickel	body weight	0.01		0.005	0.01
			Thallium	—		—	—	Thallium	blood	0.03		0.0006	0.03
			Vanadium	—		—	—	Vanadium	ND	0.007		0.006	0.01
			Zinc	—		—	—	Zinc	blood	0.02		0.0004	0.02
			Pesticides					*Pesticides*					
			4,4'-DDT	6.68E-07		1.43E-07	8.11E-07	4,4'-DDT	liver	0.009		0.002	0.01
			PCBs					*PCBs*					
			Aroclor 1260	1.04E-06		2.23E-07	1.27E-06	Aroclor 1260	eye	0.06		0.01	0.07
			(Total)	7.60E-06	NA	1.71E-07	8.37E-06	(Total)		0.7	NA	0.3	1

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Table 6-15
Summary of Receptor Risks and Hazards For COPCs
Reasonable Maximum Exposure
Future Resident Adult — Surface Soil, Sediment and Surface Water — Mill Pond, and Groundwater — Off-Site Surficial Aquifer
Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report
Baseline Human Health Risk Assessment
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Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Air	Particulates from Surface Soil	*SVOCs*					*SVOCs*					
			Benzo(a)pyrene		3.30E-11		3.30E-11	Benzo(a)pyrene	NA		—		—
			bis(2-Ethylhexyl)phthalate		1.16E-11		1.16E-11	bis(2-Ethylhexyl)phthalate	NA		—		—
			Inorganics					*Inorganics*					
			Aluminum		—		—	Aluminum	ND		0.002		0.002
			Arsenic		2.77E-09		2.77E-09	Arsenic	NA		—		—
			Barium		—		—	Barium	NA		—		—
			Chromium		1.01E-06		1.01E-06	Chromium	lungs		0.002		0.002
			Copper		—		—	Copper	NA		—		—
			Iron		—		—	Iron	NA		—		—
			Lead		—		—	Lead	NA		—		—
			Manganese		—		—	Manganese	CNS		0.002		0.002
			Nickel		—		—	Nickel	NA		—		—
			Thallium		—		—	Thallium	NA		—		—
			Vanadium		—		—	Vanadium	NA		—		—
			Zinc		—		—	Zinc	NA		—		—
			Pesticides					*Pesticides*					
			4,4'-DDT		4.13E-11		4.13E-11	4,4'-DDT	NA		—		—
			PCBs					*PCBs*					
			Aroclor 1260		6.46E-11		6.46E-11	Aroclor 1260	NA		—		—
			(Total)	NA	1.01E-06	NA	1.01E-06	(Total)		NA	0.006	NA	0.006
	Air	Vapors from Surface Soil	*VOCs*					*VOCs*					
			2-Methylnaphthalene		—		—	2-Methylnaphthalene	nose		0.04		0.04
			Naphthalene		—		—	Naphthalene	nose		0.3		0.3
			Xylenes (total)		—		—	Xylenes (total)	NA		—		—
			(Total)	NA	0.00E+00	NA	0.00E+00	(Total)		NA	0.3	NA	0.3
Sediment	Sediment	Sediment Mill Pond	*Inorganics*					*Inorganics*					
			Vanadium	—		—	—	Vanadium	ND	0.01		0.01	0.03
			(Total)	0.00E+00	NA	0.00E+00	0.00E+00	(Total)		0.01	NA	0.01	0.03

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Table 6-15
Summary of Receptor Risks and Hazards For COPCs
Reasonable Maximum Exposure
Future Resident Adult — Surface Soil, Sediment and Surface Water — Mill Pond, and Groundwater — Off-Site Surficial Aquifer
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Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	*Adult*

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Water	Surface Water	Surface Water Mill Pond	*VOCs*					*VOCs*					
			cis-1,2-Dichloroethene	—		—	—	cis-1,2-Dichloroethene	blood	0.00005		0.00005	0.00009
			Vinyl chloride (Chloroethene)	3.19E-06		2.43E-06	5.62E-06	Vinyl chloride (Chloroethene)	liver	0.002		0.001	0.003
			SVOCs					*SVOCs*					
			bis(2-Ethylhexyl)phthalate	8.67E-08		2.99E-07	3.86E-07	bis(2-Ethylhexyl)phthalate	liver	0.0007		0.002	0.003
			Inorganics					*Inorganics*					
			Iron	—		—	—	Iron	liver	0.002		0.0003	0.002
			Pesticides					*Pesticides*					
			beta-BHC	5.55E-08		1.09E-07	1.64E-07	beta-BHC	liver/kidney	0.0002		0.0005	0.0007
			(Total)	3.33E-06	NA	2.84E-06	6.17E-06	(Total)		0.005	NA	0.005	0.009
	Animal Tissue	Fish from Mill Pond	*VOCs*					*VOCs*					
			cis-1,2-Dichloroethene	—			—	cis-1,2-Dichloroethene	blood	0.0004			0.0004
			Vinyl chloride (Chloroethene)	1.18E-05			1.18E-05	Vinyl chloride (Chloroethene)	liver	0.007			0.007
			SVOCs					*SVOCs*					
			bis(2-Ethylhexyl)phthalate	7.16E-04			7.16E-04	bis(2-Ethylhexyl)phthalate	liver	6			6
			Inorganics					*Inorganics*					
			Iron	—			—	Iron	liver	2			2
			Pesticides					*Pesticides*					
			beta-BHC	6.64E-05			6.64E-05	beta-BHC	liver/kidney	0.3			0.3
			(Total)	7.94E-04	NA	NA	7.94E-04	(Total)		8	NA	NA	8
Groundwater	Groundwater	Groundwater Off-Site Surficial Aquifer	*VOCs*					*VOCs*					
			1,1-Dichloroethene	—		—	—	1,1-Dichloroethene	liver	0.002		—	0.002
			Benzene	7.09E-07		—	7.09E-07	Benzene	ND	0.01		—	0.01
			cis-1,2-Dichloroethene	—		—	—	cis-1,2-Dichloroethene	blood	2		—	2
			Trichloroethene	3.16E-03		—	3.16E-03	Trichloroethene	liver/kidney	61		—	61
			Vinyl chloride (Chloroethene)	6.41E-03		—	6.41E-03	Vinyl chloride (Chloroethene)	liver	4		—	4

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Table 6-15
Summary of Receptor Risks and Hazards For COPCs
Reasonable Maximum Exposure
Future Resident Adult — Surface Soil, Sediment and Surface Water — Mill Pond, and Groundwater — Off-Site Surficial Aquifer
Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report
Baseline Human Health Risk Assessment
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Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Groundwater	Groundwater Off-Site Surficial Aquifer	*SVOCs*					*SVOCs*					
			bis(2-Ethylhexyl)phthalate	3.54E-06		2.10E-07	3.75E-06	bis(2-Ethylhexyl)phthalate	liver	0.03		0.002	0.03
			Inorganics					*Inorganics*					
			Chromium	—		—	—	Chromium	none	0.5		0.06	0.6
			Cyanide, Total	—		—	—	Cyanide, Total	CNS/thyroid/body weight	0.01		0.00004	0.01
			Iron	—		—	—	Iron	liver	0.5		0.001	0.5
			Manganese	—		—	—	Manganese	CNS	0.1		0.009	0.1
			Nickel	—		—	—	Nickel	body weight	0.1		0.008	0.1
			Pesticides					*Pesticides*					
			beta-BHC	6.16E-07		2.08E-08	6.37E-07	beta-BHC	liver/kidney	0.003		0.00009	0.003
			Dieldrin	1.37E-05		3.95E-07	1.41E-05	Dieldrin	liver	0.04		0.001	0.04
			(Total)	9.59E-03	NA	6.26E-07	9.59E-03	(Total)		68	NA	0.08	68
	Air	Groundwater Water Vapors at Showerhead Off-Site Surficial Aquifer	*VOCs*					*VOCs*					
			1,1-Dichloroethene		—		—	1,1-Dichloroethene	liver		0.002		0.002
			Benzene		3.52E-07		3.52E-07	Benzene	ND		0.02		0.02
			cis-1,2-Dichloroethene		—		—	cis-1,2-Dichloroethene	NA		—		—
			Trichloroethene		3.16E-03		3.16E-03	Trichloroethene	NA		—		—
			Vinyl chloride (Chloroethene)		1.41E-04		1.41E-04	Vinyl chloride (Chloroethene)	liver		0.4		0.4
			(Total)	NA	3.30E-03	NA	3.30E-03	(Total)		NA	0.4	NA	0.4

Total Risk Across Surface Soil	9.38E-06
Total Risk Across Sediment — Mill Pond	0.00E+00
Total Risk Across Surface Water — Mill Pond	8.00E-04
Total Risk Across Groundwater — Off-Site Surficial Aquifer	1.29E-02
Total Risk Across All Media and All Exposure Routes	1.37E-02

Total Hazard Index Across Surface Soil	1
Total Hazard Index Across Sediment — Mill Pond	0.03
Total Hazard Index Across Surface Water — Mill Pond	8
Total Hazard Index Across Groundwater — Off-Site Surficial Aquifer	69
Total Hazard Index Across All Media and All Exposure Routes	78

NA - Not Applicable
ND - No Data
CNS - Central Nervous System

Target Organ HI per Medium

Organ	Soil	Sediment	Surface Water	Groundwater
blood	0.05	NA	0.0005	2
body weight	0.01	NA	NA	0.1
CNS	0.06	NA	NA	0.2
eye	0.07	NA	NA	NA
gastrointestinal	0.02	NA	NA	NA
kidney	0.004	NA	0.3	61
liver	0.1	NA	8	66
lungs	0.002	NA	NA	NA
nose	0.3	NA	NA	NA
skin	0.02	NA	NA	NA
thyroid	NA	NA	NA	0.01
none/ND	0.6	0.03	NA	0.6

Total blood HI	2
Total body weight HI	0.2
Total CNS HI	0.2
Total eye HI	0.07
Total gastrointestinal HI	0.02
Total kidney HI	62
Total liver HI	74
Total lungs HI	0.002
Total nose HI	0.3
Total skin HI	0.02
Total thyroid HI	0.01
Total none/ND HI	1

Table 6-16
Summary of Receptor Risks and Hazards For COPCs
Reasonable Maximum Exposure
Future Resident Adult — Subsurface Soil (Exposed Soil Only), Sediment and Surface Water — Mill Pond, and Groundwater — Off-Site Surficial Aquifer
Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report
Baseline Human Health Risk Assessment
Former Thompson Industries Site
Madison, Florida

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Subsurface Soil	Subsurface Soil	Exposed Subsurface Soil	*VOCs*					*VOCs*					
			Naphthalene	—		—	—	Naphthalene	body weight	0.004		0.0008	0.004
			Inorganics					*Inorganics*					
			Aluminum	—		—	—	Aluminum	CNS	0.2		0.004	0.2
			Arsenic	3.56E-06		7.62E-08	3.64E-06	Arsenic	skin	0.02		0.0004	0.02
			Barium	—		—	—	Barium	kidney	0.003		0.001	0.004
			Chromium	—		—	—	Chromium	none	0.2		0.1	0.3
			Copper	—		—	—	Copper	gastrointestinal	0.02		0.0005	0.02
			Iron	—		—	—	Iron	liver	0.07		0.001	0.07
			Vanadium	—		—	—	Vanadium	ND	0.01		0.009	0.02
			(Total)	3.56E-06	NA	7.62E-08	3.64E-06	(Total)		0.5	NA	0.2	0.7
	Air	Particulates from Exposed Subsurface Soil	*Inorganics*					*Inorganics*					
			Aluminum		—		—	Aluminum	ND		0.01		0.01
			Arsenic		2.22E-09		2.22E-09	Arsenic	NA		—		—
			Barium		—		—	Barium	NA		—		—
			Chromium		5.49E-07		5.49E-07	Chromium	lungs		0.001		0.001
			Copper		—		—	Copper	NA		—		—
			Iron		—		—	Iron	NA		—		—
			Vanadium		—		—	Vanadium	NA		—		—
			(Total)	NA	5.51E-07	NA	5.51E-07	(Total)		NA	0.01	NA	0.01
	Air	Vapors from Exposed Subsurface Soil	*VOCs*					*VOCs*					
			Naphthalene		—		—	Naphthalene	nose		0.1		0.1
			(Total)	NA	0.00E+00	NA	0.00E+00	(Total)		NA	0.1	NA	0.1
Sediment	Sediment	Sediment Mill Pond	*Inorganics*					*Inorganics*					
			Vanadium	—		—	—	Vanadium	ND	0.01		0.01	0.03
			(Total)	0.00E+00	NA	0.00E+00	0.00E+00	(Total)		0.01	NA	0.01	0.03

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Table 6-16
Summary of Receptor Risks and Hazards For COPCs
Reasonable Maximum Exposure
Future Resident Adult — Subsurface Soil (Exposed Soil Only), Sediment and Surface Water — Mill Pond, and Groundwater — Off-Site Surficial Aquifer
Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report
Baseline Human Health Risk Assessment
Former Thompson Industries Site
Madison, Florida

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Water	Surface Water	Surface Water Mill Pond	*VOCs*					*VOCs*					
			cis-1,2-Dichloroethene	—		—	—	cis-1,2-Dichloroethene	blood	0.00005		0.00005	0.00009
			Vinyl chloride (Chloroethene)	3.19E-06		2.43E-06	5.62E-06	Vinyl chloride (Chloroethene)	liver	0.002		0.001	0.003
			SVOCs					*SVOCs*					
			bis(2-Ethylhexyl)phthalate	8.67E-08		2.99E-07	3.86E-07	bis(2-Ethylhexyl)phthalate	liver	0.0007		0.002	0.003
			Inorganics					*Inorganics*					
			Iron	—		—	—	Iron	liver	0.002		0.0003	0.002
			Pesticides					*Pesticides*					
			beta-BHC	5.55E-08		1.09E-07	1.64E-07	beta-BHC	liver/kidney	0.0002		0.0005	0.0007
			(Total)	3.33E-06	NA	2.84E-06	6.17E-06	(Total)		0.005	NA	0.005	0.009
	Animal Tissue	Fish from Mill Pond	*VOCs*					*VOCs*					
			cis-1,2-Dichloroethene	—			—	cis-1,2-Dichloroethene	blood	0.0004			0.0004
			Vinyl chloride (Chloroethene)	1.18E-05			1.18E-05	Vinyl chloride (Chloroethene)	liver	0.007			0.007
			SVOCs					*SVOCs*					
			bis(2-Ethylhexyl)phthalate	7.16E-04			7.16E-04	bis(2-Ethylhexyl)phthalate	liver	6			6
			Inorganics					*Inorganics*					
			Iron	—			—	Iron	liver	2			2
			Pesticides					*Pesticides*					
			beta-BHC	6.64E-05			6.64E-05	beta-BHC	liver/kidney	0.3			0.3
			(Total)	7.94E-04	NA	NA	7.94E-04	(Total)		8	NA	NA	8
Groundwater	Groundwater	Groundwater Off-Site Surficial Aquifer	*VOCs*					*VOCs*					
			1,1-Dichloroethene	—		—	—	1,1-Dichloroethene	liver	0.002		—	0.002
			Benzene	7.09E-07		—	7.09E-07	Benzene	ND	0.01		—	0.01
			cis-1,2-Dichloroethene	—		—	—	cis-1,2-Dichloroethene	blood	2		—	2
			Trichloroethene	3.16E-03		—	3.16E-03	Trichloroethene	liver/kidney	61		—	61
			Vinyl chloride (Chloroethene)	6.41E-03		—	6.41E-03	Vinyl chloride (Chloroethene)	liver	4		—	4
			SVOCs					*SVOCs*					
			bis(2-Ethylhexyl)phthalate	3.54E-06		2.10E-07	3.75E-06	bis(2-Ethylhexyl)phthalate	liver	0.03		0.002	0.03

Table 6-16
Summary of Receptor Risks and Hazards For COPCs
Reasonable Maximum Exposure
Future Resident Adult — Subsurface Soil (Exposed Soil Only), Sediment and Surface Water — Mill Pond, and Groundwater — Off-Site Surficial Aquifer
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Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Groundwater	Groundwater Off-Site Surficial Aquifer	*Inorganics*					*Inorganics*					
			Chromium	—		—	—	Chromium	none	0.5		0.06	0.6
			Cyanide, Total	—		—	—	Cyanide, Total	CNS/thyroid/body weight	0.01		0.00004	0.01
			Iron	—		—	—	Iron	liver	0.5		0.001	0.5
			Manganese	—		—	—	Manganese	CNS	0.1		0.009	0.1
			Nickel	—		—	—	Nickel	body weight	0.1		0.008	0.1
			Pesticides					*Pesticides*					
			beta-BHC	6.16E-07		2.08E-08	6.37E-07	beta-BHC	liver/kidney	0.003		0.00009	0.003
			Dieldrin	1.37E-05		3.95E-07	1.41E-05	Dieldrin	liver	0.04		0.001	0.04
			(Total)	9.59E-03	NA	6.26E-07	9.59E-03	(Total)		68	NA	0.08	68
	Air	Groundwater Water Vapors at Showerhead Off-Site Surficial Aquifer	*VOCs*					*VOCs*					
			1,1-Dichloroethene		—		—	1,1-Dichloroethene	liver		0.002		0.002
			Benzene		3.52E-07		3.52E-07	Benzene	ND		0.02		0.02
			cis-1,2-Dichloroethene		—		—	cis-1,2-Dichloroethene	NA		—		—
			Trichloroethene		3.16E-03		3.16E-03	Trichloroethene	NA		—		—
			Vinyl chloride (Chloroethene)		1.41E-04		1.41E-04	Vinyl chloride (Chloroethene)	liver		0.4		0.4
			(Total)	NA	3.30E-03	NA	3.30E-03	(Total)		NA	0.4	NA	0.4
						Total Risk Across Exposed Subsurface Soil	4.19E-06					Total Hazard Index Across Exposed Subsurface Soil	0.8
						Total Risk Across Sediment — Mill Pond	0.00E+00					Total Hazard Index Across Sediment — Mill Pond	0.03
						Total Risk Across Surface Water — Mill Pond	8.00E-04					Total Hazard Index Across Surface Water — Mill Pond	8
						Total Risk Across Groundwater — Off-Site Surficial Aquifer	1.29E-02					Total Hazard Index Across Groundwater — Off-Site Surficial Aquifer	69
						Total Risk Across All Media and All Exposure Routes	1.37E-02					Total Hazard Index Across All Media and All Exposure Routes	78

NA - Not Applicable
ND - No Data
CNS - Central Nervous System

Target Organ HI per Medium

Organ	Soil	Sediment	Surface Water	Groundwater		
blood	NA	NA	0.0005	2	Total blood HI	2
body weight	0.004	NA	NA	0.1	Total body weight HI	0.1
CNS	0.2	NA	NA	0.2	Total CNS HI	0.4
eye	NA	NA	NA	NA	Total eye HI	NA
gastrointestinal	0.02	NA	NA	NA	Total gastrointestinal HI	0.02
kidney	0.004	NA	0.3	61	Total kidney HI	62
liver	0.07	NA	8	66	Total liver HI	74
lungs	0.001	NA	NA	NA	Total lungs HI	0.001
nose	0.1	NA	NA	NA	Total nose HI	0.1
skin	0.02	NA	NA	NA	Total skin HI	0.02
thyroid	NA	NA	NA	0.01	Total thyroid HI	0.01
none/ND	0.3	0.03	NA	0.6	Total none/ND HI	1

Table 6-17
Summary of Receptor Risks and Hazards For COPCs
Reasonable Maximum Exposure
Future Resident Adult — Subsurface Soil, Sediment and Surface Water — Mill Pond, and Groundwater — Off-Site Surficial Aquifer
Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report
Baseline Human Health Risk Assessment
Former Thompson Industries Site
Madison, Florida

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Subsurface Soil	Subsurface Soil	Subsurface Soil	*VOCs*					*VOCs*					
			2-Methylnaphthalene	—		—	—	2-Methylnaphthalene	body weight	0.0006		0.0001	0.0007
			cis-1,2-Dichloroethene	—		—	—	cis-1,2-Dichloroethene	blood	0.0004		0.00008	0.0005
			Naphthalene	—		—	—	Naphthalene	body weight	0.002		0.0004	0.002
			Vinyl chloride (Chloroethene)	6.20E-07		1.33E-07	7.52E-07	Vinyl chloride (Chloroethene)	liver	0.0003		0.00007	0.0004
			Xylenes (total)	—		—	—	Xylenes (total)	CNS	0.00002		0.000005	0.00003
			SVOCs					*SVOCs*					
			Benzo(a)pyrene	1.26E-06		2.69E-07	1.53E-06	Benzo(a)pyrene	NA	—		—	—
			bis(2-Ethylhexyl)phthalate	7.90E-08		1.69E-08	9.60E-08	bis(2-Ethylhexyl)phthalate	liver	0.0007		0.0001	0.0008
			Inorganics					*Inorganics*					
			Aluminum	—		—	—	Aluminum	CNS	0.03		0.0005	0.03
			Antimony	—		—	—	Antimony	blood	0.004		0.0006	0.005
			Arsenic	3.22E-06		6.90E-08	3.29E-06	Arsenic	skin	0.02		0.0004	0.02
			Barium	—		—	—	Barium	kidney	0.002		0.0007	0.003
			Chromium	—		—	—	Chromium	none	0.1		0.1	0.2
			Copper	—		—	—	Copper	gastrointestinal	0.007		0.0001	0.007
			Iron	—		—	—	Iron	liver	0.08		0.002	0.08
			Lead	—		—	—	Lead	NA	—		—	—
			Manganese	—		—	—	Manganese	CNS	0.01		0.006	0.02
			Nickel	—		—	—	Nickel	body weight	0.004		0.002	0.006
			Thallium	—		—	—	Thallium	blood	0.02		0.0005	0.02
			Vanadium	—		—	—	Vanadium	ND	0.006		0.005	0.01
			Zinc	—		—	—	Zinc	blood	0.008		0.0002	0.008
			Pesticides					*Pesticides*					
			4,4'-DDT	1.03E-07		2.21E-08	1.25E-07	4,4'-DDT	liver	0.001		0.0003	0.002
			PCBs					*PCBs*					
			Aroclor 1260	6.26E-07		1.34E-07	7.60E-07	Aroclor 1260	eye	0.04		0.008	0.04
			(Total)	5.91E-06	NA	6.44E-07	6.55E-06	(Total)		0.4	NA	0.1	0.5

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Table 6-17
Summary of Receptor Risks and Hazards For COPCs
Reasonable Maximum Exposure
Future Resident Adult — Subsurface Soil, Sediment and Surface Water — Mill Pond, and Groundwater — Off-Site Surficial Aquifer
Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report
Baseline Human Health Risk Assessment
Former Thompson Industries Site
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Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Subsurface Soil	Air	Particulates from Subsurface Soil	***SVOCs***					***SVOCs***					
			Benzo(a)pyrene		3.30E-11		3.30E-11	Benzo(a)pyrene	NA		—		—
			bis(2-Ethylhexyl)phthalate		4.89E-12		4.89E-12	bis(2-Ethylhexyl)phthalate	NA		—		—
			Inorganics					***Inorganics***					
			Aluminum		—		—	Aluminum	ND		0.002		0.002
			Antimony		—		—	Antimony	NA		—		—
			Arsenic		2.01E-09		2.01E-09	Arsenic	NA		—		—
			Barium		—		—	Barium	NA		—		—
			Chromium		4.21E-07		4.21E-07	Chromium	lungs		0.0008		0.0008
			Copper		—		—	Copper	NA		—		—
			Iron		—		—	Iron	NA		—		—
			Lead		—		—	Lead	NA		—		—
			Manganese		—		—	Manganese	CNS		0.001		0.001
			Nickel		—		—	Nickel	NA		—		—
			Thallium		—		—	Thallium	NA		—		—
			Vanadium		—		—	Vanadium	NA		—		—
			Zinc		—		—	Zinc	NA		—		—
			Pesticides					***Pesticides***					
			4,4'-DDT		6.39E-12		6.39E-12	4,4'-DDT	NA		—		—
			PCBs					***PCBs***					
			Aroclor 1260		3.87E-11		3.87E-11	Aroclor 1260	NA		—		—
			(Total)	NA	4.23E-07	NA	4.23E-07	(Total)		NA	0.004	NA	0.004
	Air	Vapors from Subsurface Soil	***VOCs***					***VOCs***					
			2-Methylnaphthalene		—		—	2-Methylnaphthalene	nose		0.02		0.02
			cis-1,2-Dichloroethene		—		—	cis-1,2-Dichloroethene	NA		—		—
			Naphthalene		—		—	Naphthalene	nose		0.07		0.07
			Vinyl chloride (Chloroethene)		1.18E-06		1.18E-06	Vinyl chloride (Chloroethene)	liver		0.003		0.003
			Xylenes (total)		—		—	Xylenes (total)	NA		—		—
			(Total)	NA	1.18E-06	NA	1.18E-06	(Total)		NA	0.1	NA	0.1

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Table 6-17
Summary of Receptor Risks and Hazards For COPCs
Reasonable Maximum Exposure
Future Resident Adult — Subsurface Soil, Sediment and Surface Water — Mill Pond, and Groundwater — Off-Site Surficial Aquifer
Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report
Baseline Human Health Risk Assessment
Former Thompson Industries Site
Madison, Florida

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Sediment	Sediment	Sediment Mill Pond	*Inorganics*					*Inorganics*					
			Vanadium	—		—	—	Vanadium	ND	0.01		0.01	0.03
			(Total)	0.00E+00	NA	0.00E+00	0.00E+00	(Total)		0.01	NA	0.01	0.03
Surface Water	Surface Water	Surface Water Mill Pond	*VOCs*					*VOCs*					
			cis-1,2-Dichloroethene	—		—	—	cis-1,2-Dichloroethene	blood	0.00005		0.00005	0.00009
			Vinyl chloride (Chloroethene)	3.19E-06		2.43E-06	5.62E-06	Vinyl chloride (Chloroethene)	liver	0.002		0.001	0.003
			SVOCs					*SVOCs*					
			bis(2-Ethylhexyl)phthalate	8.67E-08		2.99E-07	3.86E-07	bis(2-Ethylhexyl)phthalate	liver	0.0007		0.002	0.003
			Inorganics					*Inorganics*					
			Iron	—		—	—	Iron	liver	0.002		0.0003	0.002
			Pesticides					*Pesticides*					
			beta-BHC	5.55E-08		1.09E-07	1.64E-07	beta-BHC	liver/kidney	0.0002		0.0005	0.0007
			(Total)	3.33E-06	NA	2.84E-06	6.17E-06	(Total)		0.005	NA	0.005	0.009
	Animal Tissue	Fish from Mill Pond	*VOCs*					*VOCs*					
			cis-1,2-Dichloroethene	—			—	cis-1,2-Dichloroethene	blood	0.0004			0.0004
			Vinyl chloride (Chloroethene)	1.18E-05			1.18E-05	Vinyl chloride (Chloroethene)	liver	0.007			0.007
			SVOCs					*SVOCs*					
			bis(2-Ethylhexyl)phthalate	7.16E-04			7.16E-04	bis(2-Ethylhexyl)phthalate	liver	6			6
			Inorganics					*Inorganics*					
			Iron	—			—	Iron	liver	2			2
			Pesticides					*Pesticides*					
			beta-BHC	6.64E-05			6.64E-05	beta-BHC	liver/kidney	0.3			0.3
			(Total)	7.94E-04	NA	NA	7.94E-04	(Total)		8	NA	NA	8

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Table 6-17
Summary of Receptor Risks and Hazards For COPCs
Reasonable Maximum Exposure
Future Resident Adult — Subsurface Soil, Sediment and Surface Water — Mill Pond, and Groundwater — Off-Site Surficial Aquifer
Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report
Baseline Human Health Risk Assessment
Former Thompson Industries Site
Madison, Florida

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Groundwater	Groundwater Off-Site Surficial Aquifer	*VOCs*					*VOCs*					
			1,1-Dichloroethene	—		—	—	1,1-Dichloroethene	liver	0.002		—	0.002
			Benzene	7.09E-07		—	7.09E-07	Benzene	ND	0.01		—	0.01
			cis-1,2-Dichloroethene	—		—	—	cis-1,2-Dichloroethene	blood	2		—	2
			Trichloroethene	3.16E-03		—	3.16E-03	Trichloroethene	liver/kidney	61		—	61
			Vinyl chloride (Chloroethene)	6.41E-03		—	6.41E-03	Vinyl chloride (Chloroethene)	liver	4		—	4
			SVOCs					*SVOCs*					
			bis(2-Ethylhexyl)phthalate	3.54E-06		2.10E-07	3.75E-06	bis(2-Ethylhexyl)phthalate	liver	0.03		0.002	0.03
			Inorganics					*Inorganics*					
			Chromium	—		—	—	Chromium	none	0.5		0.06	0.6
			Cyanide, Total	—		—	—	Cyanide, Total	CNS/thyroid/body weight	0.01		0.00004	0.01
			Iron	—		—	—	Iron	liver	0.5		0.001	0.5
			Manganese	—		—	—	Manganese	CNS	0.1		0.009	0.1
			Nickel	—		—	—	Nickel	body weight	0.1		0.008	0.1
			Pesticides					*Pesticides*					
			beta-BHC	6.16E-07		2.08E-08	6.37E-07	beta-BHC	liver/kidney	0.003		0.00009	0.003
			Dieldrin	1.37E-05		3.95E-07	1.41E-05	Dieldrin	liver	0.04		0.001	0.04
			(Total)	9.59E-03	NA	6.26E-07	9.59E-03	(Total)		68	NA	0.08	68
	Air	Groundwater Water Vapors at Showerhead Off-Site Surficial Aquifer	*VOCs*					*VOCs*					
			1,1-Dichloroethene		—		—	1,1-Dichloroethene	liver		0.002		0.002
			Benzene		3.52E-07		3.52E-07	Benzene	ND		0.02		0.02
			cis-1,2-Dichloroethene		—		—	cis-1,2-Dichloroethene	NA		—		—
			Trichloroethene		3.16E-03		3.16E-03	Trichloroethene	NA		—		—
			Vinyl chloride (Chloroethene)		1.41E-04		1.41E-04	Vinyl chloride (Chloroethene)	liver		0.4		0.4
			(Total)	NA	3.30E-03	NA	3.30E-03	(Total)		NA	0.4	NA	0.4

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Table 6-17
Summary of Receptor Risks and Hazards For COPCs
Reasonable Maximum Exposure
Future Resident Adult — Subsurface Soil, Sediment and Surface Water — Mill Pond, and Groundwater — Off-Site Surficial Aquifer
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Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
						Total Risk Across Subsurface Soil	8.15E-06					Total Hazard Index Across Subsurface Soil	0.6
						Total Risk Across Sediment — Mill Pond	0.00E+00					Total Hazard Index Across Sediment — Mill Pond	0.03
						Total Risk Across Surface Water — Mill Pond	8.00E-04					Total Hazard Index Across Surface Water — Mill Pond	8
						Total Risk Across Groundwater — Off-Site Surficial Aquifer	1.29E-02					Total Hazard Index Across Groundwater — Off-Site Surficial Aquifer	69
						Total Risk Across All Media and All Exposure Routes	1.37E-02					Total Hazard Index Across All Media and All Exposure Routes	77

NA - Not Applicable
ND - No Data
CNS - Central Nervous System

Target Organ HI per Medium

Organ	Soil	Sediment	Surface Water	Groundwater	
blood	0.04	NA	0.0005	2	Total blood HI 2
body weight	0.009	NA	NA	0.1	Total body weight HI 0.1
CNS	0.05	NA	NA	0.2	Total CNS HI 0.2
eye	0.04	NA	NA	NA	Total eye HI 0.04
gastrointestinal	0.007	NA	NA	NA	Total gastrointestinal HI 0.007
kidney	0.003	NA	0.3	61	Total kidney HI 62
liver	0.09	NA	8	66	Total liver HI 74
lungs	0.0008	NA	NA	NA	Total lungs HI 0.0008
nose	0.1	NA	NA	NA	Total nose HI 0.1
skin	0.02	NA	NA	NA	Total skin HI 0.02
thyroid	NA	NA	NA	0.01	Total thyroid HI 0.01
none/ND	0.2	0.03	NA	0.6	Total none/ND HI 0.9

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Table 6-18
Summary of Receptor Risks and Hazards For COPCs
Reasonable Maximum Exposure
Future Resident Adult — Surface Soil (Exposed Soil Only), Sediment and Surface Water — Mill Pond, and Groundwater — Off-Site Floridan Aquifer
Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report
Baseline Human Health Risk Assessment
Former Thompson Industries Site
Madison, Florida

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	Exposed Surface Soil	*VOCs*					*VOCs*					
			Naphthalene	—		—	—	Naphthalene	body weight	0.004		0.0008	0.004
			Inorganics					*Inorganics*					
			Aluminum	—		—	—	Aluminum	CNS	0.5		0.01	0.6
			Arsenic	6.11E-06		1.31E-07	6.24E-06	Arsenic	skin	0.03		0.0007	0.03
			Barium	—		—	—	Barium	kidney	0.004		0.001	0.005
			Chromium	—		—	—	Chromium	none	0.2		0.1	0.3
			Copper	—		—	—	Copper	gastrointestinal	0.02		0.0005	0.02
			Iron	—		—	—	Iron	liver	0.1		0.003	0.1
			Vanadium	—		—	—	Vanadium	ND	0.01		0.01	0.02
			(Total)	6.11E-06	NA	1.31E-07	6.24E-06	(Total)		0.9	NA	0.2	1
	Air	Particulates from Exposed Surface Soil	*Inorganics*					*Inorganics*					
			Aluminum		—		—	Aluminum	ND		0.03		0.03
			Arsenic		3.80E-09		3.80E-09	Arsenic	NA		—		—
			Barium		—		—	Barium	NA		—		—
			Chromium		5.49E-07		5.49E-07	Chromium	lungs		0.001		0.001
			Copper		—		—	Copper	NA		—		—
			Iron		—		—	Iron	NA		—		—
			Vanadium		—		—	Vanadium	NA		—		—
			(Total)	NA	5.53E-07	NA	5.53E-07	(Total)		NA	0.03	NA	0.03
	Air	Vapors from Exposed Surface Soil	*VOCs*					*VOCs*					
			Naphthalene		—		—	Naphthalene	nose		0.1		0.1
			(Total)	NA	0.00E+00	NA	0.00E+00	(Total)		NA	0.1	NA	0.1
Sediment	Sediment	Sediment Mill Pond	*Inorganics*					*Inorganics*					
			Vanadium	—		—	—	Vanadium	ND	0.01		0.01	0.03
			(Total)	0.00E+00	NA	0.00E+00	0.00E+00	(Total)		0.01	NA	0.01	0.03
Surface Water	Surface Water	Surface Water Mill Pond	*VOCs*					*VOCs*					
			cis-1,2-Dichloroethene	—		—	—	cis-1,2-Dichloroethene	blood	0.00005		0.00005	0.00009
			Vinyl chloride (Chloroethene)	3.19E-06		2.43E-06	5.62E-06	Vinyl chloride (Chloroethene)	liver	0.002		0.001	0.003
			SVOCs					*SVOCs*					
			bis(2-Ethylhexyl)phthalate	8.67E-08		2.99E-07	3.86E-07	bis(2-Ethylhexyl)phthalate	liver	0.0007		0.002	0.003
			Inorganics					*Inorganics*					
			Iron	—		—	—	Iron	liver	0.002		0.0003	0.002
			Pesticides					*Pesticides*					
			beta-BHC	5.55E-08		1.09E-07	1.64E-07	beta-BHC	liver/kidney	0.0002		0.0005	0.0007
			(Total)	3.33E-06	NA	2.84E-06	6.17E-06	(Total)		0.005	NA	0.005	0.009

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Table 6-18
Summary of Receptor Risks and Hazards For COPCs
Reasonable Maximum Exposure
Future Resident Adult — Surface Soil (Exposed Soil Only), Sediment and Surface Water — Mill Pond, and Groundwater — Off-Site Floridan Aquifer
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Former Thompson Industries Site
Madison, Florida

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Water	Animal Tissue	Fish from Mill Pond	*VOCs*					*VOCs*					
			cis-1,3-Dichloroethene	—			—	cis-1,2-Dichloroethene	blood	0.0004			0.0004
			Vinyl chloride (Chloroethene)	1.18E-05			1.18E-05	Vinyl chloride (Chloroethene)	liver	0.007			0.007
			SVOCs					*SVOCs*					
			bis(2-Ethylhexyl)phthalate	7.16E-04			7.16E-04	bis(2-Ethylhexyl)phthalate	liver	6			6
			Inorganics					*Inorganics*					
			Iron	—			—	Iron	liver	2			2
			Pesticides					*Pesticides*					
			beta-BHC	6.64E-05			6.64E-05	beta-BHC	liver/kidney	0.3			0.3
			(Total)	7.94E-04	NA	NA	7.94E-04	(Total)		8	NA	NA	8
Groundwater	Groundwater	Groundwater Off-Site Floridan Aquifer	*VOCs*					*VOCs*					
			1,1-Dichloroethene	—		—	—	1,1-Dichloroethene	liver	0.0005		—	0.0005
			Chloroform	—		—	—	Chloroform	liver	0.001		—	0.001
			cis-1,2-Dichloroethene	—		—	—	cis-1,2-Dichloroethene	blood	0.6		—	0.6
			Trichloroethene	1.30E-03		—	1.30E-03	Trichloroethene	liver/kidney	25		—	25
			Vinyl chloride (Chloroethene)	5.00E-06		—	5.00E-06	Vinyl chloride (Chloroethene)	liver	0.003		—	0.003
			SVOCs					*SVOCs*					
			bis(2-Ethylhexyl)phthalate	2.48E-06		1.47E-07	2.63E-06	bis(2-Ethylhexyl)phthalate	liver	0.02		0.001	0.02
			Inorganics					*Inorganics*					
			Chromium	—		—	—	Chromium	none	0.2		0.02	0.2
			(Total)	1.30E-03	NA	1.47E-07	1.30E-03	(Total)		26	NA	0.02	26
	Air	Groundwater Water Vapors at Showerhead Off-Site Floridan Aquifer	*VOCs*					*VOCs*					
			1,1-Dichloroethene		—		—	1,1-Dichloroethene	liver		0.0004		0.0004
			Chloroform		2.05E-07		2.05E-07	Chloroform	ND		0.1		0.1
			cis-1,2-Dichloroethene		—		—	cis-1,2-Dichloroethene	NA		—		—
			Trichloroethene		1.30E-03		1.30E-03	Trichloroethene	NA		—		—
			Vinyl chloride (Chloroethene)		1.10E-07		1.10E-07	Vinyl chloride (Chloroethene)	liver		0.0003		0.0003
			(Total)	NA	1.30E-03	NA	1.30E-03	(Total)		NA	0.1	NA	0.1

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Table 6-18
Summary of Receptor Risks and Hazards For COPCs
Reasonable Maximum Exposure
Future Resident Adult — Surface Soil (Exposed Soil Only), Sediment and Surface Water — Mill Pond, and Groundwater — Off-Site Floridan Aquifer
Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report
Baseline Human Health Risk Assessment
Former Thompson Industries Site
Madison, Florida

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk			
				Ingestion	Inhalation	Dermal	Exposure Routes Total
						Total Risk Across Exposed Surface Soil	6.79E-06
						Total Risk Across Sediment — Mill Pond	0.00E+00
						Total Risk Across Surface Water — Mill Pond	8.00E-04
						Total Risk Across Groundwater — Off-Site Floridan Aquifer	2.60E-03
						Total Risk Across All Media and All Exposure Routes	3.41E-03

Chemical	Non-Carcinogenic Hazard Quotient				
	Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
				Total Hazard Index Across Exposed Surface Soil	1
				Total Hazard Index Across Sediment — Mill Pond	0.03
				Total Hazard Index Across Surface Water — Mill Pond	8
				Total Hazard Index Across Groundwater — Off-Site Floridan Aquifer	26
				Total Hazard Index Across All Media and All Exposure Routes	36

NA - Not Applicable
ND - No Data
CNS - Central Nervous System

Target Organ HI per Medium

Organ	Soil	Sediment	Surface Water	Groundwater	
blood	NA	NA	0.0005	0.6	Total blood HI 0.6
body weight	0.004	NA	NA	NA	Total body weight HI 0.004
CNS	0.6	NA	NA	NA	Total CNS HI 0.6
eye	NA	NA	NA	NA	Total eye HI NA
gastrointestinal	0.02	NA	NA	NA	Total gastrointestinal HI 0.02
kidney	0.005	NA	0.3	25	Total kidney HI 26
liver	0.1	NA	8	25	Total liver HI 34
lungs	0.001	NA	NA	NA	Total lungs HI 0.001
nose	0.1	NA	NA	NA	Total nose HI 0.1
skin	0.03	NA	NA	NA	Total skin HI 0.03
thyroid	NA	NA	NA	NA	Total thyroid HI NA
none/ND	0.4	0.03	NA	0.3	Total none/ND HI 0.7

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Table 6-19
Summary of Receptor Risks and Hazards For COPCs
Reasonable Maximum Exposure
Future Resident Adult — Surface Soil, Sediment and Surface Water — Mill Pond, and Groundwater — Off-Site Floridan Aquifer
Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report
Baseline Human Health Risk Assessment
Former Thompson Industries Site
Madison, Florida

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	Surface Soil	*VOCs*					*VOCs*					
			2-Methylnaphthalene	—		—	—	2-Methylnaphthalene	body weight	0.001		0.0002	0.001
			Naphthalene	—		—	—	Naphthalene	body weight	0.007		0.002	0.009
			Xylenes (total)	—		—	—	Xylenes (total)	CNS	0.00003		0.000006	0.00003
			SVOCs					*SVOCs*					
			Benzo(a)pyrene	1.26E-06		2.69E-07	1.53E-06	Benzo(a)pyrene	NA	—		—	—
			bis(2-Ethylhexyl)phthalate	1.88E-07		4.03E-08	2.28E-07	bis(2-Ethylhexyl)phthalate	liver	0.002		0.0003	0.002
			Inorganics					*Inorganics*					
			Aluminum	—		—	—	Aluminum	CNS	0.03		0.0007	0.04
			Arsenic	4.44E-06		9.51E-08	4.54E-06	Arsenic	skin	0.02		0.0005	0.02
			Barium	—		—	—	Barium	kidney	0.003		0.0008	0.004
			Chromium	—		—	—	Chromium	none	0.3		0.3	0.6
			Copper	—		—	—	Copper	gastrointestinal	0.02		0.0004	0.02
			Iron	—		—	—	Iron	liver	0.1		0.002	0.1
			Lead	—		—	—	Lead	NA	—		—	—
			Manganese	—		—	—	Manganese	CNS	0.02		0.008	0.02
			Nickel	—		—	—	Nickel	body weight	0.01		0.005	0.01
			Thallium	—		—	—	Thallium	blood	0.03		0.0006	0.03
			Vanadium	—		—	—	Vanadium	ND	0.007		0.006	0.01
			Zinc	—		—	—	Zinc	blood	0.02		0.0004	0.02
			Pesticides					*Pesticides*					
			4,4'-DDT	6.68E-07		1.43E-07	8.11E-07	4,4'-DDT	liver	0.009		0.002	0.01
			PCBs					*PCBs*					
			Aroclor 1260	1.04E-06		2.23E-07	1.27E-06	Aroclor 1260	eye	0.06		0.01	0.07
			(Total)	7.60E-06	NA	7.71E-07	8.37E-06	(Total)		0.7	NA	0.3	1

Table 6-19
Summary of Receptor Risks and Hazards For COPCs
Reasonable Maximum Exposure
Future Resident Adult — Surface Soil, Sediment and Surface Water — Mill Pond, and Groundwater — Off-Site Floridan Aquifer
Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report
Baseline Human Health Risk Assessment
Former Thompson Industries Site
Madison, Florida

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Air	Particulates from Surface Soil	*SVOCs*					*SVOCs*					
			Benzo(a)pyrene		3.30E-11		3.30E-11	Benzo(a)pyrene	NA		—		—
			bis(2-Ethylhexyl)phthalate		1.16E-11		1.16E-11	bis(2-Ethylhexyl)phthalate	NA		—		—
			Inorganics					*Inorganics*					
			Aluminum		—		—	Aluminum	ND		0.002		0.002
			Arsenic		2.77E-09		2.77E-09	Arsenic	NA		—		—
			Barium		—		—	Barium	NA		—		—
			Chromium		1.01E-06		1.01E-06	Chromium	lungs		0.002		0.002
			Copper		—		—	Copper	NA		—		—
			Iron		—		—	Iron	NA		—		—
			Lead		—		—	Lead	NA		—		—
			Manganese		—		—	Manganese	CNS		0.002		0.002
			Nickel		—		—	Nickel	NA		—		—
			Thallium		—		—	Thallium	NA		—		—
			Vanadium		—		—	Vanadium	NA		—		—
			Zinc		—		—	Zinc	NA		—		—
			Pesticides					*Pesticides*					
			4,4'-DDT		4.13E-11		4.13E-11	4,4'-DDT	NA		—		—
			PCBs					*PCBs*					
			Aroclor 1260		6.46E-11		6.46E-11	Aroclor 1260	NA		—		—
			(Total)	NA	1.01E-06	NA	1.01E-06	(Total)		NA	0.006	NA	0.006
	Air	Vapors from Surface Soil	*VOCs*					*VOCs*					
			2-Methylnaphthalene		—		—	2-Methylnaphthalene	nose		0.04		0.04
			Naphthalene		—		—	Naphthalene	nose		0.3		0.3
			Xylenes (total)		—		—	Xylenes (total)	NA		—		—
			(Total)	NA	0.00E+00	NA	0.00E+00	(Total)		NA	0.3	NA	0.3

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Table 6-19
Summary of Receptor Risks and Hazards For COPCs
Reasonable Maximum Exposure
Future Resident Adult — Surface Soil, Sediment and Surface Water — Mill Pond, and Groundwater — Off-Site Floridan Aquifer
Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report
Baseline Human Health Risk Assessment
Former Thompson Industries Site
Madison, Florida

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Sediment	Sediment	Sediment Mill Pond	*Inorganics*					*Inorganics*					
			Vanadium	—		—	—	Vanadium	ND	0.01		0.01	0.03
			(Total)	0.00E+00	NA	0.00E+00	0.00E+00	(Total)		0.01	NA	0.01	0.03
Surface Water	Surface Water	Surface Water Mill Pond	*VOCs*					*VOCs*					
			cis-1,2-Dichloroethene	—		—	—	cis-1,2-Dichloroethene	blood	0.00005		0.00005	0.00009
			Vinyl chloride (Chloroethene)	3.19E-06		2.43E-06	5.62E-06	Vinyl chloride (Chloroethene)	liver	0.002		0.001	0.003
			SVOCs					*SVOCs*					
			bis(2-Ethylhexyl)phthalate	8.67E-08		2.99E-07	3.86E-07	bis(2-Ethylhexyl)phthalate	liver	0.0007		0.002	0.003
			Inorganics					*Inorganics*					
			Iron	—		—	—	Iron	liver	0.002		0.0003	0.002
			Pesticides					*Pesticides*					
			beta-BHC	5.55E-08		1.09E-07	1.64E-07	beta-BHC	liver/kidney	0.0002		0.0005	0.0007
			(Total)	3.33E-06	NA	2.84E-06	6.17E-06	(Total)		0.005	NA	0.005	0.009
	Animal Tissue	Fish from Mill Pond	*VOCs*					*VOCs*					
			cis-1,2-Dichloroethene	—			—	cis-1,2-Dichloroethene	blood	0.0004			0.0004
			Vinyl chloride (Chloroethene)	1.18E-05			1.18E-05	Vinyl chloride (Chloroethene)	liver	0.007			0.007
			SVOCs					*SVOCs*					
			bis(2-Ethylhexyl)phthalate	7.16E-04			7.16E-04	bis(2-Ethylhexyl)phthalate	liver	6			6
			Inorganics					*Inorganics*					
			Iron	—			—	Iron	liver	2			2
			Pesticides					*Pesticides*					
			beta-BHC	6.64E-05			6.64E-05	beta-BHC	liver/kidney	0.3			0.3
			(Total)	7.94E-04	NA	NA	7.94E-04	(Total)		8	NA	NA	8

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Table 6-19
Summary of Receptor Risks and Hazards For COPCs
Reasonable Maximum Exposure
Future Resident Adult — Surface Soil, Sediment and Surface Water — Mill Pond, and Groundwater — Off-Site Floridan Aquifer
Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report
Baseline Human Health Risk Assessment
Former Thompson Industries Site
Madison, Florida

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Groundwater	Groundwater Off-Site Floridan Aquifer	*VOCs*					*VOCs*					
			1,1-Dichloroethene	—		—	—	1,1-Dichloroethene	liver	0.0005		—	0.0005
			Chloroform	—		—	—	Chloroform	liver	0.001		—	0.001
			cis-1,2-Dichloroethene	—		—	—	cis-1,2-Dichloroethene	blood	0.6		—	0.6
			Trichloroethene	1.30E-03		—	1.30E-03	Trichloroethene	liver/kidney	25		—	25
			Vinyl chloride (Chloroethene)	5.00E-06		—	5.00E-06	Vinyl chloride (Chloroethene)	liver	0.003		—	0.003
			SVOCs					*SVOCs*					
			bis(2-Ethylhexyl)phthalate	2.48E-06		1.47E-07	2.63E-06	bis(2-Ethylhexyl)phthalate	liver	0.02		0.001	0.02
			Inorganics					*Inorganics*					
			Chromium	—		—	—	Chromium	none	0.2		0.02	0.2
			(Total)	1.30E-03	NA	1.47E-07	1.30E-03	(Total)		26	NA	0.02	26
	Air	Groundwater Water Vapors at Showerhead Off-Site Floridan Aquifer	*VOCs*					*VOCs*					
			1,1-Dichloroethene		—		—	1,1-Dichloroethene	liver		0.0004		0.0004
			Chloroform		2.05E-07		2.05E-07	Chloroform	ND		0.1		0.1
			cis-1,2-Dichloroethene		—		—	cis-1,2-Dichloroethene	NA		—		—
			Trichloroethene		1.30E-03		1.30E-03	Trichloroethene	NA		—		—
			Vinyl chloride (Chloroethene)		1.10E-07		1.10E-07	Vinyl chloride (Chloroethene)	liver		0.0003		0.0003
			(Total)	NA	1.30E-03	NA	1.30E-03	(Total)		NA	0.1	NA	0.1
						Total Risk Across Surface Soil	9.38E-06					Total Hazard Index Across Surface Soil	1
						Total Risk Across Sediment — Mill Pond	0.00E+00					Total Hazard Index Across Sediment — Mill Pond	0.03
						Total Risk Across Surface Water — Mill Pond	8.00E-04					Total Hazard Index Across Surface Water — Mill Pond	8
						Total Risk Across Groundwater — Off-Site Floridan Aquifer	2.60E-03					Total Hazard Index Across Groundwater — Off-Site Floridan Aquifer	26
						Total Risk Across All Media and All Exposure Routes	3.41E-03					Total Hazard Index Across All Media and All Exposure Routes	35

NA - Not Applicable
ND - No Data
CNS - Central Nervous System

Target Organ HI per Medium

Organ	Soil	Sediment	Surface Water	Groundwater
blood	0.05	NA	0.0005	0.6
body weight	0.03	NA	NA	NA
CNS	0.06	NA	NA	NA
eye	0.07	NA	NA	NA
gastrointestinal	0.02	NA	NA	NA
kidney	0.004	NA	0.3	25
liver	0.1	NA	8	25
lungs	0.002	NA	NA	NA
nose	0.3	NA	NA	NA
skin	0.02	NA	NA	NA
thyroid	NA	NA	NA	NA
none/ND	0.6	0.03	NA	0.3

Total blood HI	0.6
Total body weight HI	0.03
Total CNS HI	0.06
Total eye HI	0.07
Total gastrointestinal HI	0.02
Total kidney HI	26
Total liver HI	34
Total lungs HI	0.002
Total nose HI	0.3
Total skin HI	0.02
Total thyroid HI	NA
Total none/ND HI	0.9

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Table 6-20
Summary of Receptor Risks and Hazards For COPCs
Reasonable Maximum Exposure
Future Resident Adult — Subsurface Soil (Exposed Soil Only), Sediment and Surface Water — Mill Pond, and Groundwater — Off-Site Floridan Aquifer
Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report
Baseline Human Health Risk Assessment
Former Thompson Industries Site
Madison, Florida

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Subsurface Soil	Subsurface Soil	Exposed Subsurface Soil	*VOCs*					*VOCs*					
			Naphthalene	—		—	—	Naphthalene	body weight	0.004		0.0008	0.004
			Inorganics					*Inorganics*					
			Aluminum	—		—	—	Aluminum	CNS	0.2		0.004	0.2
			Arsenic	3.56E-06		7.62E-08	3.64E-06	Arsenic	skin	0.02		0.0004	0.02
			Barium	—		—	—	Barium	kidney	0.003		0.001	0.004
			Chromium	—		—	—	Chromium	nose	0.2		0.1	0.3
			Copper	—		—	—	Copper	gastrointestinal	0.02		0.0005	0.02
			Iron	—		—	—	Iron	liver	0.07		0.001	0.07
			Vanadium	—		—	—	Vanadium	ND	0.01		0.009	0.02
			(Total)	3.56E-06	NA	7.62E-08	3.64E-06	(Total)		0.5	NA	0.2	0.7
	Air	Particulates from Exposed Subsurface Soil	*Inorganics*					*Inorganics*					
			Aluminum		—		—	Aluminum	ND		0.01		0.01
			Arsenic		2.22E-09		2.22E-09	Arsenic	NA		—		—
			Barium		—		—	Barium	NA		—		—
			Chromium		5.49E-07		5.49E-07	Chromium	lungs		0.001		0.001
			Copper		—		—	Copper	NA		—		—
			Iron		—		—	Iron	NA		—		—
			Vanadium		—		—	Vanadium	NA		—		—
			(Total)	NA	5.51E-07	NA	5.51E-07	(Total)		NA	0.01	NA	0.01
	Air	Vapors from Exposed Subsurface Soil	*VOCs*					*VOCs*					
			Naphthalene		—		—	Naphthalene	nose		0.1		0.1
			(Total)	NA	0.00E+00	NA	0.00E+00	(Total)		NA	0.1	NA	0.1
Sediment	Sediment	Sediment Mill Pond	*Inorganics*					*Inorganics*					
			Vanadium	—		—	—	Vanadium	ND	0.01		0.01	0.03
			(Total)	0.00E+00	NA	0.00E+00	0.00E+00	(Total)		0.01	NA	0.01	0.03

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Table 6-20
Summary of Receptor Risks and Hazards For COPCs
Reasonable Maximum Exposure
Future Resident Adult — Subsurface Soil (Exposed Soil Only), Sediment and Surface Water — Mill Pond, and Groundwater — Off-Site Floridan Aquifer
Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report
Baseline Human Health Risk Assessment
Former Thompson Industries Site
Madison, Florida

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Water	Surface Water	Surface Water Mill Pond	*VOCs*					*VOCs*					
			cis-1,2-Dichloroethene	—		—	—	cis-1,2-Dichloroethene	blood	0.00005		0.00005	0.00009
			Vinyl chloride (Chloroethene)	3.19E-06		2.43E-06	5.62E-06	Vinyl chloride (Chloroethene)	liver	0.002		0.001	0.003
			SVOCs					*SVOCs*					
			bis(2-Ethylhexyl)phthalate	8.67E-08		2.99E-07	3.86E-07	bis(2-Ethylhexyl)phthalate	liver	0.0007		0.002	0.003
			Inorganics					*Inorganics*					
			Iron	—		—	—	Iron	liver	0.002		0.0003	0.002
			Pesticides					*Pesticides*					
			beta-BHC	5.55E-08		1.09E-07	1.64E-07	beta-BHC	liver/kidney	0.0002		0.0005	0.0007
			(Total)	3.33E-06	NA	2.84E-06	6.17E-06	(Total)		0.005	NA	0.005	0.009
	Animal Tissue	Fish from Mill Pond	*VOCs*					*VOCs*					
			cis-1,2-Dichloroethene	—			—	cis-1,2-Dichloroethene	blood	0.0004			0.0004
			Vinyl chloride (Chloroethene)	1.18E-05			1.18E-05	Vinyl chloride (Chloroethene)	liver	0.007			0.007
			SVOCs					*SVOCs*					
			bis(2-Ethylhexyl)phthalate	7.16E-04			7.16E-04	bis(2-Ethylhexyl)phthalate	liver	6			6
			Inorganics					*Inorganics*					
			Iron	—			—	Iron	liver	2			2
			Pesticides					*Pesticides*					
			beta-BHC	6.64E-05			6.64E-05	beta-BHC	liver/kidney	0.3			0.3
			(Total)	7.94E-04	NA	NA	7.94E-04	(Total)		8	NA	NA	8

Table 6-20
Summary of Receptor Risks and Hazards For COPCs
Reasonable Maximum Exposure
Future Resident Adult — Subsurface Soil (Exposed Soil Only), Sediment and Surface Water — Mill Pond, and Groundwater — Off-Site Floridan Aquifer
Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report
Baseline Human Health Risk Assessment
Former Thompson Industries Site
Madison, Florida

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Groundwater	Groundwater Off-Site Floridan Aquifer	*VOCs*					*VOCs*					
			1,1-Dichloroethene	—		—	—	1,1-Dichloroethene	liver	0.0005		—	0.0005
			Chloroform	—		—	—	Chloroform	liver	0.001		—	0.001
			cis-1,2-Dichloroethene	—		—	—	cis-1,2-Dichloroethene	blood	0.6		—	0.6
			Trichloroethene	1.30E-03		—	1.30E-03	Trichloroethene	liver/kidney	25		—	25
			Vinyl chloride (Chloroethene)	5.00E-06		—	5.00E-06	Vinyl chloride (Chloroethene)	liver	0.003		—	0.003
			SVOCs					*SVOCs*					
			bis(2-Ethylhexyl)phthalate	2.48E-06		1.47E-07	2.63E-06	bis(2-Ethylhexyl)phthalate	liver	0.02		0.001	0.02
			Inorganics					*Inorganics*					
			Chromium	—		—	—	Chromium	none	0.2		0.02	0.2
			(Total)	1.30E-03	NA	1.47E-07	1.30E-03	(Total)		26	NA	0.02	26
	Air	Groundwater Water Vapors at Showerhead Off-Site Floridan Aquifer	*VOCs*					*VOCs*					
			1,1-Dichloroethene		—		—	1,1-Dichloroethene	liver		0.0004		0.0004
			Chloroform		2.05E-07		2.05E-07	Chloroform	ND		0.1		0.1
			cis-1,2-Dichloroethene		—		—	cis-1,2-Dichloroethene	NA		—		—
			Trichloroethene		1.30E-03		1.30E-03	Trichloroethene	NA		—		—
			Vinyl chloride (Chloroethene)		1.10E-07		1.10E-07	Vinyl chloride (Chloroethene)	liver		0.0003		0.0003
			(Total)	NA	1.30E-03	NA	1.30E-03	(Total)		NA	0.1	NA	0.1

Total Risk Across Exposed Subsurface Soil	4.19E-06
Total Risk Across Sediment — Mill Pond	0.00E+00
Total Risk Across Surface Water — Mill Pond	8.00E-04
Total Risk Across Groundwater — Off-Site Floridan Aquifer	2.60E-03
Total Risk Across All Media and All Exposure Routes	3.41E-03

Total Hazard Index Across Exposed Subsurface Soil	0.8
Total Hazard Index Across Sediment — Mill Pond	0.03
Total Hazard Index Across Surface Water — Mill Pond	8
Total Hazard Index Across Groundwater — Off-Site Floridan Aquifer	26
Total Hazard Index Across All Media and All Exposure Routes	35

NA - Not Applicable
ND - No Data
CNS - Central Nervous System

Target Organ HI per Medium

Organ	Soil	Sediment	Surface Water	Groundwater		
blood	NA	NA	0.0005	0.6	Total blood HI	0.6
body weight	0.004	NA	NA	NA	Total body weight HI	0.004
CNS	0.2	NA	NA	NA	Total CNS HI	0.2
eye	NA	NA	NA	NA	Total eye HI	NA
gastrointestinal	0.02	NA	NA	NA	Total gastrointestinal HI	0.02
kidney	0.004	NA	0.3	25	Total kidney HI	26
liver	0.07	NA	8	25	Total liver HI	34
lungs	0.001	NA	NA	NA	Total lungs HI	0.001
nose	0.1	NA	NA	NA	Total nose HI	0.1
skin	0.02	NA	NA	NA	Total skin HI	0.02
thyroid	NA	NA	NA	NA	Total thyroid HI	NA
none/ND	0.3	0.03	NA	0.3	Total none/ND HI	0.6

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Table 6-21
Summary of Receptor Risks and Hazards For COPCs
Reasonable Maximum Exposure
Future Resident Adult — Subsurface Soil, Sediment and Surface Water — Mill Pond, and Groundwater — Off-Site Floridan Aquifer
Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report
Baseline Human Health Risk Assessment
Former Thompson Industries Site
Madison, Florida

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Subsurface Soil	Subsurface Soil	Subsurface Soil	*VOCs*					*VOCs*					
			2-Methylnaphthalene	—		—	—	2-Methylnaphthalene	body weight	0.0006		0.0001	0.0007
			cis-1,2-Dichloroethene	—		—	—	cis-1,2-Dichloroethene	blood	0.0004		0.00008	0.0005
			Naphthalene	—		—	—	Naphthalene	body weight	0.002		0.0004	0.002
			Vinyl chloride (Chloroethene)	6.20E-07		1.33E-07	7.52E-07	Vinyl chloride (Chloroethene)	liver	0.0003		0.00007	0.0004
			Xylenes (total)	—		—	—	Xylenes (total)	CNS	0.00002		0.000005	0.00003
			SVOCs					*SVOCs*					
			Benzo(a)pyrene	1.26E-06		2.69E-07	1.53E-06	Benzo(a)pyrene	NA	—		—	—
			bis(2-Ethylhexyl)phthalate	7.90E-08		1.69E-08	9.60E-08	bis(2-Ethylhexyl)phthalate	liver	0.0007		0.0001	0.0008
			Inorganics					*Inorganics*					
			Aluminum	—		—	—	Aluminum	CNS	0.03		0.0005	0.03
			Antimony	—		—	—	Antimony	blood	0.004		0.0006	0.005
			Arsenic	3.22E-06		6.90E-08	3.29E-06	Arsenic	skin	0.02		0.0004	0.02
			Barium	—		—	—	Barium	kidney	0.002		0.0007	0.003
			Chromium	—		—	—	Chromium	none	0.1		0.1	0.2
			Copper	—		—	—	Copper	gastrointestinal	0.007		0.0001	0.007
			Iron	—		—	—	Iron	liver	0.08		0.002	0.08
			Lead	—		—	—	Lead	NA	—		—	—
			Manganese	—		—	—	Manganese	CNS	0.01		0.006	0.02
			Nickel	—		—	—	Nickel	body weight	0.004		0.002	0.006
			Thallium	—		—	—	Thallium	blood	0.02		0.0005	0.02
			Vanadium	—		—	—	Vanadium	ND	0.006		0.005	0.01
			Zinc	—		—	—	Zinc	blood	0.008		0.0002	0.008
			Pesticides					*Pesticides*					
			4,4'-DDT	1.03E-07		2.21E-08	1.25E-07	4,4'-DDT	liver	0.001		0.0003	0.002
			PCBs					*PCBs*					
			Aroclor 1260	6.26E-07		1.34E-07	7.60E-07	Aroclor 1260	eye	0.04		0.008	0.04
			(Total)	5.91E-06	NA	6.44E-07	6.55E-06	(Total)		0.4	NA	0.1	0.5

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Table 6-21
Summary of Receptor Risks and Hazards For COPCs
Reasonable Maximum Exposure
Future Resident Adult — Subsurface Soil, Sediment and Surface Water — Mill Pond, and Groundwater — Off-Site Floridan Aquifer
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Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Subsurface Soil	Air	Particulates from Subsurface Soil	*SVOCs*					*SVOCs*					
			Benzo(a)pyrene		3.30E-11		3.30E-11	Benzo(a)pyrene	NA		—		—
			bis(2-Ethylhexyl)phthalate		4.89E-12		4.89E-12	bis(2-Ethylhexyl)phthalate	NA		—		—
			Inorganics					*Inorganics*					
			Aluminum		—		—	Aluminum	ND		0.002		0.002
			Antimony		—		—	Antimony	NA		—		—
			Arsenic		2.01E-09		2.01E-09	Arsenic	NA		—		—
			Barium		—		—	Barium	NA		—		—
			Chromium		4.21E-07		4.21E-07	Chromium	lungs		0.0008		0.0008
			Copper		—		—	Copper	NA		—		—
			Iron		—		—	Iron	NA		—		—
			Lead		—		—	Lead	NA		—		—
			Manganese		—		—	Manganese	CNS		0.001		0.001
			Nickel		—		—	Nickel	NA		—		—
			Thallium		—		—	Thallium	NA		—		—
			Vanadium		—		—	Vanadium	NA		—		—
			Zinc		—		—	Zinc	NA		—		—
			Pesticides					*Pesticides*					
			4,4'-DDT		6.39E-12		6.39E-12	4,4'-DDT	NA		—		—
			PCBs					*PCBs*					
			Aroclor 1260		3.87E-11		3.87E-11	Aroclor 1260	NA		—		—
			(Total)	NA	4.23E-07	NA	4.23E-07	(Total)		NA	0.004	NA	0.004
	Air	Vapors from Subsurface Soil	*VOCs*					*VOCs*					
			2-Methylnaphthalene		—		—	2-Methylnaphthalene	nose		0.02		0.02
			cis-1,2-Dichloroethene		—		—	cis-1,2-Dichloroethene	NA		—		—
			Naphthalene		—		—	Naphthalene	nose		0.07		0.07
			Vinyl chloride (Chloroethene)		1.18E-06		1.18E-06	Vinyl chloride (Chloroethene)	liver		0.003		0.003
			Xylenes (total)		—		—	Xylenes (total)	NA		—		—
			(Total)	NA	1.18E-06	NA	1.18E-06	(Total)		NA	0.1	NA	0.1

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Table 6-21
Summary of Receptor Risks and Hazards For COPCs
Reasonable Maximum Exposure
Future Resident Adult — Subsurface Soil, Sediment and Surface Water — Mill Pond, and Groundwater — Off-Site Floridan Aquifer
Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report
Baseline Human Health Risk Assessment
Former Thompson Industries Site
Madison, Florida

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Sediment	Sediment	Sediment Mill Pond	*Inorganics*					*Inorganics*					
			Vanadium	—		—	—	Vanadium	ND	0.01		0.01	0.03
			(Total)	0.00E+00	NA	0.00E+00	0.00E+00	(Total)		0.01	NA	0.01	0.03
Surface Water	Surface Water	Surface Water Mill Pond	*VOCs*					*VOCs*					
			cis-1,2-Dichloroethene	—		—	—	cis-1,2-Dichloroethene	blood	0.00005		0.00005	0.00009
			Vinyl chloride (Chloroethene)	3.19E-06		2.43E-06	5.62E-06	Vinyl chloride (Chloroethene)	liver	0.002		0.001	0.003
			SVOCs					*SVOCs*					
			bis(2-Ethylhexyl)phthalate	8.67E-08		2.99E-07	3.86E-07	bis(2-Ethylhexyl)phthalate	liver	0.0007		0.002	0.003
			Inorganics					*Inorganics*					
			Iron	—		—	—	Iron	liver	0.002		0.0003	0.002
			Pesticides					*Pesticides*					
			beta-BHC	5.55E-08		1.09E-07	1.64E-07	beta-BHC	liver/kidney	0.0002		0.0005	0.0007
			(Total)	3.33E-06	NA	2.84E-06	6.17E-06	(Total)		0.005	NA	0.005	0.009
	Animal Tissue	Fish from Mill Pond	*VOCs*					*VOCs*					
			cis-1,2-Dichloroethene	—			—	cis-1,2-Dichloroethene	blood	0.0004			0.0004
			Vinyl chloride (Chloroethene)	1.18E-05			1.18E-05	Vinyl chloride (Chloroethene)	liver	0.007			0.007
			SVOCs					*SVOCs*					
			bis(2-Ethylhexyl)phthalate	7.16E-04			7.16E-04	bis(2-Ethylhexyl)phthalate	liver	6			6
			Inorganics					*Inorganics*					
			Iron	—			—	Iron	liver	2			2
			Pesticides					*Pesticides*					
			beta-BHC	6.64E-05			6.64E-05	beta-BHC	liver/kidney	0.3			0.3
			(Total)	7.94E-04	NA	NA	7.94E-04	(Total)		8	NA	NA	8

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Table 6-21
Summary of Receptor Risks and Hazards For COPCs
Reasonable Maximum Exposure
Future Resident Adult — Subsurface Soil, Sediment and Surface Water — Mill Pond, and Groundwater — Off-Site Floridan Aquifer
Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report
Baseline Human Health Risk Assessment
Former Thompson Industries Site
Madison, Florida

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Groundwater	Groundwater	*VOCs*					*VOCs*					
		Off-Site	1,1-Dichloroethene	—		—	—	1,1-Dichloroethene	liver	0.0005		—	0.0005
		Floridan Aquifer	Chloroform	—		—	—	Chloroform	liver	0.001		—	0.001
			cis-1,2-Dichloroethene	—		—	—	cis-1,2-Dichloroethene	blood	0.6		—	0.6
			Trichloroethene	1.30E-03		—	1.30E-03	Trichloroethene	liver/kidney	25		—	25
			Vinyl chloride (Chloroethene)	5.00E-06		—	5.00E-06	Vinyl chloride (Chloroethene)	liver	0.003		—	0.003
			SVOCs					*SVOCs*					
			bis(2-Ethylhexyl)phthalate	2.48E-06		1.47E-07	2.63E-06	bis(2-Ethylhexyl)phthalate	liver	0.02		0.001	0.02
			Inorganics					*Inorganics*					
			Chromium	—		—	—	Chromium	none	0.2		0.02	0.2
			(Total)	1.30E-03	NA	1.47E-07	1.30E-03	(Total)		26	NA	0.02	26
	Air	Groundwater	*VOCs*					*VOCs*					
		Water Vapors	1,1-Dichloroethene		—		—	1,1-Dichloroethene	liver		0.0004		0.0004
		at Showerhead	Chloroform		2.05E-07		2.05E-07	Chloroform	ND		0.1		0.1
		Off-Site	cis-1,2-Dichloroethene		—		—	cis-1,2-Dichloroethene	NA		—		—
		Floridan Aquifer	Trichloroethene		1.30E-03		1.30E-03	Trichloroethene	NA		—		—
			Vinyl chloride (Chloroethene)		1.10E-07		1.10E-07	Vinyl chloride (Chloroethene)	liver		0.0003		0.0003
			(Total)	NA	1.30E-03	NA	1.30E-03	(Total)		NA	0.1	NA	0.1

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Table 6-21
Summary of Receptor Risks and Hazards For COPCs
Reasonable Maximum Exposure
Future Resident Adult — Subsurface Soil, Sediment and Surface Water — Mill Pond, and Groundwater — Off-Site Floridan Aquifer
Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report
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Madison, Florida

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
						Total Risk Across Subsurface Soil	8.15E-06					Total Hazard Index Across Subsurface Soil	0.6
						Total Risk Across Sediment — Mill Pond	0.00E+00					Total Hazard Index Across Sediment — Mill Pond	0.03
						Total Risk Across Surface Water — Mill Pond	8.00E-04					Total Hazard Index Across Surface Water — Mill Pond	8
						Total Risk Across Groundwater — Off-Site Floridan Aquifer	2.60E-03					Total Hazard Index Across Groundwater — Off-Site Floridan Aquifer	26
						Total Risk Across All Media and All Exposure Routes	3.41E-03					Total Hazard Index Across All Media and All Exposure Routes	35

NA - Not Applicable
ND - No Data
CNS - Central Nervous System

Target Organ HI per Medium

Organ	Soil	Sediment	Surface Water	Groundwater	
blood	0.04	NA	0.0005	0.6	Total blood HI 0.6
body weight	0.009	NA	NA	NA	Total body weight HI 0.009
CNS	0.05	NA	NA	NA	Total CNS HI 0.05
eye	0.04	NA	NA	NA	Total eye HI 0.04
gastrointestinal	0.007	NA	NA	NA	Total gastrointestinal HI 0.007
kidney	0.003	NA	0.3	25	Total kidney HI 26
liver	0.09	NA	8	25	Total liver HI 34
lungs	0.0008	NA	NA	NA	Total lungs HI 0.0008
nose	0.1	NA	NA	NA	Total nose HI 0.1
skin	0.02	NA	NA	NA	Total skin HI 0.02
thyroid	NA	NA	NA	NA	Total thyroid HI NA
none/ND	0.2	0.03	NA	0.3	Total none/ND HI 0.5

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Table 6-22
Summary of Receptor Risks and Hazards For COPCs
Reasonable Maximum Exposure
Future Resident Child — Surface Soil (Exposed Soil Only), Sediment and Surface Water — Mill Pond, and Groundwater — On-Site Surficial Aquifer
Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report
Baseline Human Health Risk Assessment
Former Thompson Industries Site
Madison, Florida

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Child

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	Exposed Surface Soil						*VOCs*					
								Naphthalene	body weight	0.01		0.001	0.01
								Inorganics					
								Aluminum	CNS	2		0.02	2
								Arsenic	skin	0.1		0.001	0.1
								Barium	kidney	0.01		0.002	0.02
								Chromium	none	0.6		0.2	0.8
								Copper	gastrointestinal	0.08		0.0007	0.08
								Iron	liver	0.4		0.004	0.4
								Vanadium	ND	0.04		0.01	0.06
			(Total)	NA	NA	NA	NA	(Total)		3	NA	0.3	3
	Air	Particulates from Exposed Surface Soil						*Inorganics*					
								Aluminum	ND		0.09		0.09
								Arsenic	NA		—		—
								Barium	NA		—		—
								Chromium	lungs		0.003		0.003
								Copper	NA		—		—
								Iron	NA		—		—
								Vanadium	NA		—		—
			(Total)	NA	NA	NA	NA	(Total)		NA	0.09	NA	0.09
	Air	Vapors from Exposed Surface Soil						*VOCs*					
								Naphthalene	nose		0.3		0.3
			(Total)	NA	NA	NA	NA	(Total)		NA	0.3	NA	0.3
Sediment	Sediment	Sediment Mill Pond						*Inorganics*					
								Vanadium	ND	0.05		0.02	0.07
			(Total)	NA	NA	NA	NA	(Total)		0.05	NA	0.02	0.07
Surface Water	Surface Water	Surface Water Mill Pond						*VOCs*					
								cis-1,2-Dichloroethene	blood	0.0002		0.00007	0.0003
								Vinyl chloride (Chloroethene)	liver	0.008		0.001	0.01
								SVOCs					
								bis(2-Ethylhexyl)phthalate	liver	0.003		0.004	0.007
								Inorganics					
								Iron	liver	0.007		0.0004	0.008
								Pesticides					
								beta-BHC	liver/kidney	0.001		0.0007	0.002
			(Total)	NA	NA	NA	NA	(Total)		0.02	NA	0.007	0.03

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Table 6-22
Summary of Receptor Risks and Hazards For COPCs
Reasonable Maximum Exposure
Future Resident Child — Surface Soil (Exposed Soil Only), Sediment and Surface Water — Mill Pond, and Groundwater — On-Site Surficial Aquifer
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Baseline Human Health Risk Assessment
Former Thompson Industries Site
Madison, Florida

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Child

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Water	Animal Tissue	Fish Tissue from Mill Pond						*VOCs*					
								cis-1,2-Dichloroethene	blood	0.0007			0.0007
								Vinyl chloride (Chloroethene)	liver	0.01			0.01
								SVOCs					
								bis(2-Ethylhexyl)phthalate	liver	9			9
								Inorganics					
								Iron	liver	3			3
								Pesticides					
			(Total)	NA	NA	NA	NA	beta-BHC	liver/kidney	0.5			0.5
								(Total)		13	NA	NA	13
Groundwater	Groundwater	Groundwater On-Site Surficial Aquifer						*VOCs*					
								1,1-Dichloroethene	liver	0.003		—	0.003
								1,4-Dichlorobenzene	ND	0.009		—	0.009
								Benzene	ND	0.1		—	0.1
								Chloroform	liver	0.002		—	0.002
								cis-1,2-Dichloroethene	blood	5		—	5
								Naphthalene	body weight	0.01		—	0.01
								Toluene	liver/kidney	0.007		—	0.007
								trans-1,2-Dichloroethene	blood	0.01		—	0.01
								Trichloroethene	liver/kidney	166		—	166
								Vinyl chloride (Chloroethene)	liver	20		—	20
								Inorganics					
								Iron	liver	4		0.009	4
								Manganese	CNS	3		0.2	3
								Pesticides					
								beta-BHC	liver/kidney	0.007		0.0002	0.007
								Heptachlor	liver	0.002		0.00004	0.002
			(Total)	NA	NA	NA	NA	(Total)		198	NA	0.2	198
Groundwater	Air	Groundwater Water Vapors at Showerhead On-Site Surficial Aquifer						*VOCs*					
								1,1-Dichloroethene	liver		0.002		0.002
								1,4-Dichlorobenzene	liver		0.001		0.001
								Benzene	ND		0.2		0.2
								Chloroform	ND		0.2		0.2
								cis-1,2-Dichloroethene	NA		—		—
								Naphthalene	nose		0.3		0.3
								Toluene	CNS		0.01		0.01
								trans-1,2-Dichloroethene	NA		—		—
								Trichloroethene	NA		—		—
								Vinyl chloride (Chloroethene)	liver		2		2
			(Total)	NA	NA	NA	NA	(Total)			3	NA	3

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Table 6-22
Summary of Receptor Risks and Hazards For COPCs
Reasonable Maximum Exposure
Future Resident Child — Surface Soil (Exposed Soil Only), Sediment and Surface Water — Mill Pond, and Groundwater — On-Site Surficial Aquifer
Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report
Baseline Human Health Risk Assessment
Former Thompson Industries Site
Madison, Florida

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Child

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
						Total Risk Across Exposed Surface Soil	NA					Total Hazard Index Across Exposed Surface Soil	4
						Total Risk Across Sediment — Mill Pond	NA					Total Hazard Index Across Sediment — Mill Pond	0.07
						Total Risk Across Surface Water — Mill Pond	NA					Total Hazard Index Across Surface Water — Mill Pond	13
						Total Risk Across Groundwater — On-Site Surficial Aquifer	NA					Total Hazard Index Across Groundwater — On-Site Surficial Aquifer	201
						Total Risk Across All Media and All Exposure Routes	NA					Total Hazard Index Across All Media and All Exposure Routes	218

NA - Not Applicable
ND - No Data
CNS - Central Nervous System

Target Organ HI per Medium

Organ	Soil	Sediment	Surface Water	Groundwater	
blood	NA	NA	0.0009	5	Total blood HI: 5
body weight	0.01	NA	NA	0.01	Total body weight HI: 0.03
CNS	2	NA	NA	3	Total CNS HI: 5
eye	NA	NA	NA	NA	Total eye HI: NA
gastrointestinal	0.08	NA	NA	NA	Total gastrointestinal HI: 0.08
kidney	0.02	NA	0.5	166	Total kidney HI: 167
liver	0.4	NA	13	192	Total liver HI: 206
lungs	0.003	NA	NA	NA	Total lungs HI: 0.003
nose	0.3	NA	NA	0.3	Total nose HI: 0.6
skin	0.1	NA	NA	NA	Total skin HI: 0.1
thyroid	NA	NA	NA	NA	Total thyroid HI: NA
none/ND	0.9	0.07	NA	0.5	Total none/ND HI: 2

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Table 6-23
Summary of Receptor Risks and Hazards For COPCs
Reasonable Maximum Exposure
Future Resident Child — Surface Soil, Sediment and Surface Water — Mill Pond, and Groundwater — On-Site Surficial Aquifer
Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report
Baseline Human Health Risk Assessment
Former Thompson Industries Site
Madison, Florida

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Child

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	Surface Soil						*VOCs*					
								2-Methylnaphthalene	body weight	0.004		0.0004	0.004
								Naphthalene	body weight	0.03		0.002	0.03
								Xylenes (total)	CNS	0.0001		0.000009	0.0001
								SVOCs					
								Benzo(a)pyrene	NA	—		—	—
								bis(2-Ethylhexyl)phthalate	liver	0.005		0.0005	0.006
								Inorganics					
								Aluminum	CNS	0.1		0.001	0.1
								Arsenic	skin	0.08		0.0007	0.08
								Barium	kidney	0.01		0.001	0.01
								Chromium	none	1		0.4	1
								Copper	gastrointestinal	0.07		0.0006	0.07
								Iron	liver	0.4		0.004	0.4
								Lead	NA	—		—	—
								Manganese	CNS	0.05		0.01	0.07
								Nickel	body weight	0.03		0.008	0.04
								Thallium	blood	0.1		0.0009	0.1
								Vanadium	ND	0.02		0.009	0.03
								Zinc	blood	0.06		0.0006	0.06
								Pesticides					
								4,4'-DDT	liver	0.03		0.003	0.04
								PCBs					
								Aroclor 1260	eye	0.2		0.02	0.2
			(Total)	NA	NA	NA	NA	(Total)		2	NA	0.4	3

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Table 6-23
Summary of Receptor Risks and Hazards For COPCs
Reasonable Maximum Exposure
Future Resident Child — Surface Soil, Sediment and Surface Water — Mill Pond, and Groundwater — On-Site Surficial Aquifer
Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report
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Former Thompson Industries Site
Madison, Florida

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Child

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Air	Particulates from Surface Soil						*SVOCs*					
								Benzo(a)pyrene	NA		—		—
								bis(2-Ethylhexyl)phthalate	NA		—		—
								Inorganics					
								Aluminum	ND		0.006		0.006
								Arsenic	NA		—		—
								Barium	NA		—		—
								Chromium	lungs		0.005		0.005
								Copper	NA		—		—
								Iron	NA		—		—
								Lead	NA		—		—
								Manganese	CNS		0.004		0.004
								Nickel	NA		—		—
								Thallium	NA		—		—
								Vanadium	NA		—		—
								Zinc	NA		—		—
								Pesticides					
								4,4'-DDT	NA		—		—
								PCBs					
			(Total)	NA	NA	NA	NA	Aroclor 1260	NA		—		—
								(Total)		NA	0.01	NA	0.01
	Air	Vapors from Surface Soil						*VOCs*					
								2-Methylnaphthalene	nose		0.1		0.1
								Naphthalene	nose		0.7		0.7
								Xylenes (total)	NA		—		—
			(Total)	NA	NA	NA	NA	(Total)		NA	0.8	NA	0.8

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Table 6-23
Summary of Receptor Risks and Hazards For COPCs
Reasonable Maximum Exposure
Future Resident Child — Surface Soil, Sediment and Surface Water — Mill Pond, and Groundwater — On-Site Surficial Aquifer
Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report
Baseline Human Health Risk Assessment
Former Thompson Industries Site
Madison, Florida

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Child

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Sediment	Sediment	Sediment Mill Pond						*Inorganics*					
			(Total)	NA	NA	NA	NA	Vanadium	ND	0.05		0.02	0.07
								(Total)		0.05	NA	0.02	0.07
Surface Water	Surface Water	Surface Water Mill Pond						*VOCs*					
								cis-1,2-Dichloroethene	blood	0.0002		0.00007	0.0003
								Vinyl chloride (Chloroethene)	liver	0.008		0.002	0.01
								SVOCs					
								bis(2-Ethylhexyl)phthalate	liver	0.003		0.004	0.007
								Inorganics					
								Iron	liver	0.007		0.0004	0.008
								Pesticides					
								beta-BHC	liver/kidney	0.001		0.0007	0.002
			(Total)	NA	NA	NA	NA	(Total)		0.02	NA	0.007	0.03
	Animal Tissue	Surface Water Mill Pond						*VOCs*					
								cis-1,2-Dichloroethene	blood	0.0007			0.0007
								Vinyl chloride (Chloroethene)	liver	0.01			0.01
								SVOCs					
								bis(2-Ethylhexyl)phthalate	liver	9			9
								Inorganics					
								Iron	liver	3			3
								Pesticides					
			(Total)	NA	NA	NA	NA	beta-BHC	liver/kidney	0.5			0.5
								(Total)		13	NA	NA	13

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Table 6-23
Summary of Receptor Risks and Hazards For COPCs
Reasonable Maximum Exposure
Future Resident Child — Surface Soil, Sediment and Surface Water — Mill Pond, and Groundwater — On-Site Surficial Aquifer
Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report
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Former Thompson Industries Site
Madison, Florida

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Child

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Groundwater	Groundwater - On-Site Surficial Aquifer						*VOCs*					
								1,1-Dichloroethene	liver	0.003		—	0.003
								1,4-Dichlorobenzene	ND	0.009		—	0.009
								Benzene	ND	0.1		—	0.1
								Chloroform	liver	0.002		—	0.002
								cis-1,2-Dichloroethene	blood	5		—	5
								Naphthalene	body weight	0.01		—	0.01
								Toluene	liver/kidney	0.007		—	0.007
								trans-1,2-Dichloroethene	blood	0.01		—	0.01
								Trichloroethene	liver/kidney	166		—	166
								Vinyl chloride (Chloroethene)	liver	20		—	20
								Inorganics					
								Iron	liver	4		0.009	4
								Manganese	CNS	3		0.2	3
								Pesticides					
								beta-BHC	liver/kidney	0.007		0.0002	0.007
								Heptachlor	liver	0.002		0.00004	0.002
			(Total)	NA	NA	NA	NA	(Total)		198	NA	0.2	198
	Air	Groundwater Water Vapors at Showerhead On-Site Surficial Aquifer						*VOCs*					
								1,1-Dichloroethene	liver		0.002		0.002
								1,4-Dichlorobenzene	liver		0.001		0.001
								Benzene	ND		0.2		0.2
								Chloroform	ND		0.2		0.2
								cis-1,2-Dichloroethene	NA		—		—
								Naphthalene	nose		0.3		0.3
								Toluene	CNS		0.01		0.01
								trans-1,2-Dichloroethene	NA		—		—
								Trichloroethene	NA		—		—
								Vinyl chloride (Chloroethene)	liver		2		2
			(Total)	NA	NA	NA	NA	(Total)		NA	3	NA	3

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Table 6-23
Summary of Receptor Risks and Hazards For COPCs
Reasonable Maximum Exposure
Future Resident Child — Surface Soil, Sediment and Surface Water — Mill Pond, and Groundwater — On-Site Surficial Aquifer
Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report
Baseline Human Health Risk Assessment
Former Thompson Industries Site
Madison, Florida

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Child

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
						Total Risk Across Surface Soil	NA					Total Hazard Index Across Surface Soil	4
						Total Risk Across Sediment — Mill Pond	NA					Total Hazard Index Across Sediment — Mill Pond	0.07
						Total Risk Across Surface Water — Mill Pond	NA					Total Hazard Index Across Surface Water — Mill Pond	13
						Total Risk Across Groundwater — On-Site Surficial Aquifer	NA					Total Hazard Index Across Groundwater — On-Site Surficial Aquifer	201
						Total Risk Across All Media and All Exposure Routes	NA					Total Hazard Index Across All Media and All Exposure Routes	218

NA - Not Applicable
ND - No Data
CNS - Central Nervous System

Target Organ HI per Medium

Organ	Soil	Sediment	Surface Water	Groundwater	
blood	0.2	NA	0.0009	5	Total blood HI 5
body weight	0.07	NA	NA	0.01	Total body weight HI 0.09
CNS	0.2	NA	NA	3	Total CNS HI 3
eye	0.2	NA	NA	NA	Total eye HI 0.2
gastrointestinal	0.07	NA	NA	NA	Total gastrointestinal HI 0.07
kidney	0.01	NA	0.5	166	Total kidney HI 167
liver	0.4	NA	13	192	Total liver HI 206
lungs	0.005	NA	NA	NA	Total lungs HI 0.005
nose	0.8	NA	NA	0.3	Total nose HI 1
skin	0.08	NA	NA	NA	Total skin HI 0.08
thyroid	NA	NA	NA	NA	Total thyroid HI NA
none/ND	1	0.07	NA	0.5	Total none/ND HI 2

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Table 6-24
Summary of Receptor Risks and Hazards For COPCs
Reasonable Maximum Exposure
Future Resident Child — Subsurface Soil (Exposed Soil Only), Sediment and Surface Water — Mill Pond, and Groundwater — On-Site Surficial Aquifer
Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report
Baseline Human Health Risk Assessment
Former Thompson Industries Site
Madison, Florida

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Child

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Subsurface Soil	Subsurface Soil	Exposed Subsurface Soil						*VOCs*					
								Naphthalene	body weight	0.01		0.001	0.01
								Inorganics					
								Aluminum	CNS	0.7		0.007	0.7
								Arsenic	skin	0.06		0.0006	0.07
								Barium	kidney	0.01		0.002	0.01
								Chromium	none	0.6		0.2	0.8
								Copper	gastrointestinal	0.08		0.0007	0.08
								Iron	liver	0.2		0.002	0.2
								Vanadium	ND	0.04		0.01	0.05
			(Total)	NA	NA	NA	NA	(Total)		2	NA	0.2	2
	Air	Particulates from Exposed Subsurface Soil						*Inorganics*					
								Aluminum	ND		0.03		0.03
								Arsenic	NA		—		—
								Barium	NA		—		—
								Chromium	lungs		0.003		0.003
								Copper	NA		—		—
								Iron	NA		—		—
								Vanadium	NA		—		—
			(Total)	NA	NA	NA	NA	(Total)		NA	0.04	NA	0.04
	Air	Vapors from Exposed Subsurface Soil						*VOCs*					
								Naphthalene	nose		0.3		0.3
			(Total)	NA	NA	NA	NA	(Total)		NA	0.3	NA	0.3
Sediment	Sediment	Sediment Mill Pond						*Inorganics*					
								Vanadium	ND	0.05		0.02	0.07
			(Total)	NA	NA	NA	NA	(Total)		0.05	NA	0.02	0.07
Surface Water	Surface Water	Surface Water Mill Pond						*VOCs*					
								cis-1,2-Dichloroethene	blood	0.0002		0.00007	0.0003
								Vinyl chloride (Chloroethene)	liver	0.008		0.002	0.01
								SVOCs					
								bis(2-Ethylhexyl)phthalate	liver	0.003		0.004	0.007
								Inorganics					
								Iron	liver	0.007		0.0004	0.008
								Pesticides					
								beta-BHC	liver/kidney	0.001		0.0007	0.002
			(Total)	NA	NA	NA	NA	(Total)		0.02	NA	0.007	0.03

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Table 6-24
Summary of Receptor Risks and Hazards For COPCs
Reasonable Maximum Exposure
Future Resident Child — Subsurface Soil (Exposed Soil Only), Sediment and Surface Water — Mill Pond, and Groundwater — On-Site Surficial Aquifer
Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report
Baseline Human Health Risk Assessment
Former Thompson Industries Site
Madison, Florida

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Child

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Water	Animal Tissue	Fish Tissue from Mill Pond						*VOCs*					
								cis-1,2-Dichloroethene	blood	0.0007			0.0007
								Vinyl chloride (Chloroethene)	liver	0.01			0.01
								SVOCs					
								bis(2-Ethylhexyl)phthalate	liver	9			9
								Inorganics					
								Iron	liver	3			3
								Pesticides					
								beta-BHC	liver/kidney	0.5			0.5
			(Total)	NA	NA	NA	NA	(Total)		13	NA	NA	13
Groundwater	Groundwater	Groundwater On-Site Surficial Aquifer						*VOCs*					
								1,1-Dichloroethene	liver	0.003		—	0.003
								1,4-Dichlorobenzene	ND	0.009		—	0.009
								Benzene	ND	0.1		—	0.1
								Chloroform	liver	0.002		—	0.002
								cis-1,2-Dichloroethene	blood	5		—	5
								Naphthalene	body weight	0.01		—	0.01
								Toluene	liver/kidney	0.007		—	0.007
								trans-1,2-Dichloroethene	blood	0.01		—	0.01
								Trichloroethene	liver/kidney	166		—	166
								Vinyl chloride (Chloroethene)	liver	20		—	20
								Inorganics					
								Iron	liver	4		0.009	4
								Manganese	CNS	3		0.2	3
								Pesticides					
								beta-BHC	liver/kidney	0.007		0.0002	0.007
								Heptachlor	liver	0.002		0.00004	0.002
			(Total)	NA	NA	NA	NA	(Total)		198	NA	0.2	198
	Air	Groundwater Water Vapors at Showerhead On-Site Surficial Aquifer						*VOCs*					
								1,1-Dichloroethene	liver		0.002		0.002
								1,4-Dichlorobenzene	liver		0.001		0.001
								Benzene	ND		0.2		0.2
								Chloroform	ND		0.2		0.2
								cis-1,2-Dichloroethene	NA		—		—
								Naphthalene	nose		0.3		0.3
								Toluene	CNS		0.01		0.01
								trans-1,2-Dichloroethene	NA		—		—
								Trichloroethene	NA		—		—
								Vinyl chloride (Chloroethene)	liver		2		2
			(Total)	NA	NA	NA	NA	(Total)		NA	3	NA	3

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Table 6-24
Summary of Receptor Risks and Hazards For COPCs
Reasonable Maximum Exposure
Future Resident Child — Subsurface Soil (Exposed Soil Only), Sediment and Surface Water — Mill Pond, and Groundwater — On-Site Surficial Aquifer
Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report
Baseline Human Health Risk Assessment
Former Thompson Industries Site
Madison, Florida

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Child

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
			Total Risk Across Exposed Subsurface Soil				NA	Total Hazard Index Across Exposed Subsurface Soil					2
			Total Risk Across Sediment — Mill Pond				NA	Total Hazard Index Across Sediment — Mill Pond					0.07
			Total Risk Across Surface Water — Mill Pond				NA	Total Hazard Index Across Surface Water — Mill Pond					13
			Total Risk Across Groundwater — On-Site Surficial Aquifer				NA	Total Hazard Index Across Groundwater — On-Site Surficial Aquifer					201
			Total Risk Across All Media and All Exposure Routes				NA	Total Hazard Index Across All Media and All Exposure Routes					217

NA - Not Applicable
ND - No Data
CNS - Central Nervous System

Target Organ HI per Medium

Organ	Soil	Sediment	Surface Water	Groundwater		
blood	NA	NA	0.0009	5	Total blood HI	5
body weight	0.01	NA	NA	0.01	Total body weight HI	0.03
CNS	0.7	NA	NA	3	Total CNS HI	4
eye	NA	NA	NA	NA	Total eye HI	NA
gastrointestinal	0.08	NA	NA	NA	Total gastrointestinal HI	0.08
kidney	0.01	NA	0.5	166	Total kidney HI	167
liver	0.2	NA	13	192	Total liver HI	205
lungs	0.003	NA	NA	NA	Total lungs HI	0.003
nose	0.3	NA	NA	0.3	Total nose HI	0.6
skin	0.07	NA	NA	NA	Total skin HI	0.07
thyroid	NA	NA	NA	NA	Total thyroid HI	NA
none/ND	0.9	0.07	NA	0.5	Total none/ND HI	1

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Table 6-25
Summary of Receptor Risks and Hazards For COPCs
Reasonable Maximum Exposure
Future Resident Child — Subsurface Soil, Sediment and Surface Water — Mill Pond, and Groundwater — On-Site Surficial Aquifer
Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report
Baseline Human Health Risk Assessment
Former Thompson Industries Site
Madison, Florida

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Child

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Subsurface Soil	Subsurface Soil	Subsurface Soil						*VOCs*					
								2-Methylnaphthalene	body weight	0.002		0.0002	0.002
								cis-1,2-Dichloroethene	blood	0.001		0.0001	0.001
								Naphthalene	body weight	0.007		0.0006	0.008
								Vinyl chloride (Chloroethene)	liver	0.001		0.0001	0.001
								Xylenes (total)	CNS	0.00008		0.000008	0.00009
								SVOCs					
								Benzo(a)pyrene	NA	—		—	—
								bis(2-Ethylhexyl)phthalate	liver	0.002		0.0002	0.003
								Inorganics					
								Aluminum	CNS	0.09		0.0008	0.09
								Antimony	blood	0.01		0.0009	0.02
								Arsenic	skin	0.06		0.0005	0.06
								Barium	kidney	0.008		0.001	0.01
								Chromium	none	0.4		0.2	0.6
								Copper	gastrointestinal	0.02		0.0002	0.02
								Iron	liver	0.3		0.002	0.3
								Lead	NA	—		—	—
								Manganese	CNS	0.04		0.01	0.05
								Nickel	body weight	0.01		0.003	0.02
								Thallium	blood	0.08		0.0007	0.08
								Vanadium	ND	0.02		0.007	0.03
								Zinc	blood	0.03		0.0003	0.03
								Pesticides					
								4,4'-DDT	liver	0.005		0.0005	0.005
								PCBs					
			(Total)	NA	NA	NA	NA	Aroclor 1260	eye	0.1		0.01	0.1
								(Total)		1	NA	0.2	1

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Table 6-25
Summary of Receptor Risks and Hazards For COPCs
Reasonable Maximum Exposure
Future Resident Child — Subsurface Soil, Sediment and Surface Water — Mill Pond, and Groundwater — On-Site Surficial Aquifer
Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report
Baseline Human Health Risk Assessment
Former Thompson Industries Site
Madison, Florida

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Child

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Subsurface Soil	Air	Particulates from Subsurface Soil						*SVOCs*					
								Benzo(a)pyrene	NA		—		—
								bis(2-Ethylhexyl)phthalate	NA		—		—
								Inorganics					
								Aluminum	ND		0.004		0.004
								Antimony	NA		—		—
								Arsenic	NA		—		—
								Barium	NA		—		—
								Chromium	lungs		0.002		0.002
								Copper	NA		—		—
								Iron	NA		—		—
								Lead	NA		—		—
								Manganese	CNS		0.003		0.003
								Nickel	NA		—		—
								Thallium	NA		—		—
								Vanadium	NA		—		—
								Zinc	NA		—		—
								Pesticides					
								4,4'-DDT	NA		—		—
								PCBs					
								Aroclor 1260	NA		—		—
			(Total)	NA	NA	NA	NA	(Total)		NA	0.009	NA	0.009
	Air	Vapors from Subsurface Soil						*VOCs*					
								2-Methylnaphthalene	nose		0.05		0.05
								cis-1,2-Dichloroethene	NA		—		—
								Naphthalene	nose		0.2		0.2
								Vinyl chloride (Chloroethene)	liver		0.008		0.008
								Xylenes (total)	NA		—		—
			(Total)	NA	NA	NA	NA	(Total)		NA	0.3	NA	0.3

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Table 6-25
Summary of Receptor Risks and Hazards For COPCs
Reasonable Maximum Exposure
Future Resident Child — Subsurface Soil, Sediment and Surface Water — Mill Pond, and Groundwater — On-Site Surficial Aquifer
Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report
Baseline Human Health Risk Assessment
Former Thompson Industries Site
Madison, Florida

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Child

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Sediment	Sediment	Sediment Mill Pond						*Inorganics*					
			Vanadium						ND	0.05		0.02	0.07
			(Total)	NA	NA	NA	NA	(Total)		0.05	NA	0.02	0.07
Surface Water	Surface Water	Surface Water Mill Pond						*VOCs*					
			cis-1,2-Dichloroethene						blood	0.0002		0.00007	0.0003
			Vinyl chloride (Chloroethene)						liver	0.008		0.002	0.01
								SVOCs					
			bis(2-Ethylhexyl)phthalate						liver	0.003		0.004	0.007
								Inorganics					
			Iron						liver	0.007		0.0004	0.008
								Pesticides					
			beta-BHC						liver/kidney	0.001		0.0007	0.002
			(Total)	NA	NA	NA	NA	(Total)		0.02	NA	0.007	0.03
	Animal Tissue	Fish from Mill Pond						*VOCs*					
			cis-1,2-Dichloroethene						blood	0.0007			0.0007
			Vinyl chloride (Chloroethene)						liver	0.01			0.01
								SVOCs					
			bis(2-Ethylhexyl)phthalate						liver	9			9
								Inorganics					
			Iron						liver	3			3
								Pesticides					
			beta-BHC						liver/kidney	0.5			0.5
			(Total)	NA	NA	NA	NA	(Total)		13	NA	NA	13

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Table 6-25
Summary of Receptor Risks and Hazards For COPCs
Reasonable Maximum Exposure
Future Resident Child — Subsurface Soil, Sediment and Surface Water — Mill Pond, and Groundwater — On-Site Surficial Aquifer
Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report
Baseline Human Health Risk Assessment
Former Thompson Industries Site
Madison, Florida

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Child

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Groundwater	Groundwater - On-Site Surficial Aquifer						*VOCs*					
								1,1-Dichloroethene	liver	0.003		—	0.003
								1,4-Dichlorobenzene	ND	0.009		—	0.009
								Benzene	ND	0.1		—	0.1
								Chloroform	liver	0.002		—	0.002
								cis-1,2-Dichloroethene	blood	5		—	5
								Naphthalene	body weight	0.01		—	0.01
								Toluene	liver/kidney	0.007		—	0.007
								trans-1,2-Dichloroethene	blood	0.01		—	0.01
								Trichloroethene	liver/kidney	166		—	166
								Vinyl chloride (Chloroethene)	liver	20		—	20
								Inorganics					
								Iron	liver	4		0.009	4
								Manganese	CNS	3		0.2	3
								Pesticides					
								beta-BHC	liver/kidney	0.007		0.0002	0.007
								Heptachlor	liver	0.002		0.00004	0.002
			(Total)	NA	NA	NA	NA	(Total)		198	NA	0.2	198
	Air	Groundwater Water Vapors at Showerhead On-Site Surficial Aquifer						*VOCs*					
								1,1-Dichloroethene	liver		0.002		0.002
								1,4-Dichlorobenzene	liver		0.001		0.001
								Benzene	ND		0.2		0.2
								Chloroform	ND		0.2		0.2
								cis-1,2-Dichloroethene	NA		—		—
								Naphthalene	nose		0.3		0.3
								Toluene	CNS		0.01		0.01
								trans-1,2-Dichloroethene	NA		—		—
								Trichloroethene	NA		—		—
								Vinyl chloride (Chloroethene)	liver		2		2
			(Total)	NA	NA	NA	NA	(Total)		NA	3	NA	3

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Table 6-25
Summary of Receptor Risks and Hazards For COPCs
Reasonable Maximum Exposure
Future Resident Child — Subsurface Soil, Sediment and Surface Water — Mill Pond, and Groundwater — On-Site Surficial Aquifer
Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report
Baseline Human Health Risk Assessment
Former Thompson Industries Site
Madison, Florida

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Child

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
						Total Risk Across Subsurface Soil	NA					Total Hazard Index Across Subsurface Soil	2
						Total Risk Across Sediment — Mill Pond	NA					Total Hazard Index Across Sediment — Mill Pond	0.07
						Total Risk Across Surface Water — Mill Pond	NA					Total Hazard Index Across Surface Water — Mill Pond	13
						Total Risk Across Groundwater — On-Site Surficial Aquifer	NA					Total Hazard Index Across Groundwater — On-Site Surficial Aquifer	201
						Total Risk Across All Media and All Exposure Routes	NA					Total Hazard Index Across All Media and All Exposure Routes	216

NA - Not Applicable
ND - No Data
CNS - Central Nervous System

Target Organ HI per Medium

Organ	Soil	Sediment	Surface Water	Groundwater		
blood	0.1	NA	0.0009	5	Total blood HI	5
body weight	0.03	NA	NA	0.01	Total body weight HI	0.04
CNS	0.1	NA	NA	3	Total CNS HI	3
eye	0.1	NA	NA	NA	Total eye HI	0.1
gastrointestinal	0.02	NA	NA	NA	Total gastrointestinal HI	0.02
kidney	0.01	NA	0.5	166	Total kidney HI	167
liver	0.3	NA	13	192	Total liver HI	206
lungs	0.002	NA	NA	NA	Total lungs HI	0.002
nose	0.2	NA	NA	0.3	Total nose HI	0.5
skin	0.06	NA	NA	NA	Total skin HI	0.06
thyroid	NA	NA	NA	NA	Total thyroid HI	NA
none/ND	0.6	0.07	NA	0.5	Total none/ND HI	1

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Table 6-26
Summary of Receptor Risks and Hazards For COPCs
Reasonable Maximum Exposure
Future Resident Child — Surface Soil (Exposed Soil Only), Sediment and Surface Water — Mill Pond, and Groundwater — Off-Site Surficial Aquifer
Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report
Baseline Human Health Risk Assessment
Former Thompson Industries Site
Madison, Florida

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Child

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	Exposed Surface Soil						*VOCs*					
								Naphthalene	body weight	0.01		0.001	0.01
								Inorganics					
								Aluminum	CNS	2		0.02	2
								Arsenic	skin	0.1		0.001	0.1
								Barium	kidney	0.01		0.002	0.02
								Chromium	none	0.6		0.2	0.8
								Copper	gastrointestinal	0.08		0.0007	0.08
								Iron	liver	0.4		0.004	0.4
			(Total)	NA	NA	NA	NA	Vanadium	ND	0.04		0.01	0.06
								(Total)		3	NA	0.3	3
	Air	Particulates from Exposed Surface Soil						*Inorganics*					
								Aluminum	ND		0.09		0.09
								Arsenic	NA		—		—
								Barium	NA		—		—
								Chromium	hzrds		0.003		0.003
								Copper	NA		—		—
								Iron	NA		—		—
								Vanadium	NA		—		—
			(Total)	NA	NA	NA	NA	(Total)		NA	0.09	NA	0.09
	Air	Vapors from Exposed Surface Soil						*VOCs*					
								Naphthalene	none		0.3		0.3
			(Total)	NA	NA	NA	NA	(Total)		NA	0.3	NA	0.3
Sediment	Sediment	Sediment Mill Pond						*Inorganics*					
								Vanadium	ND	0.05		0.02	0.07
			(Total)	NA	NA	NA	NA	(Total)		0.05	NA	0.02	0.07
Surface Water	Surface Water	Surface Water Mill Pond						*VOCs*					
								cis-1,2-Dichloroethene	blood	0.0002		0.00007	0.0003
								Vinyl chloride (Chloroethene)	liver	0.008		0.002	0.01
								SVOCs					
								bis(2-Ethylhexyl)phthalate	liver	0.003		0.004	0.007
								Inorganics					
								Iron	liver	0.007		0.0004	0.008
								Pesticides					
								beta-BHC	liver/kidney	0.001		0.0007	0.002
			(Total)	NA	NA	NA	NA	(Total)		0.02	NA	0.007	0.03

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Table 6-26
Summary of Receptor Risks and Hazards For COPCs
Reasonable Maximum Exposure
Future Resident Child — Surface Soil (Exposed Soil Only), Sediment and Surface Water — Mill Pond, and Groundwater — Off-Site Surficial Aquifer
Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report
Baseline Human Health Risk Assessment
Former Thompson Industries Site
Madison, Florida

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Child

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Water	Animal Tissue	Fish Tissue from Mill Pond						*VOCs*					
								cis-1,2-Dichloroethene	blood	0.0007			0.0007
								Vinyl chloride (Chloroethene)	liver	0.01			0.01
								SVOCs					
								bis(2-Ethylhexyl)phthalate	liver	9			9
								Inorganics					
								Iron	liver	3			3
								Pesticides					
								beta-BHC	liver/kidney	0.5			0.5
			(Total)	NA	NA	NA	NA	(Total)		13	NA	NA	13
Groundwater	Groundwater	Groundwater Off-Site Surficial Aquifer						*VOCs*					
								1,1-Dichloroethene	liver	0.003		—	0.003
								Benzene	ND	0.02		—	0.02
								cis-1,2-Dichloroethene	blood	3		—	3
								Trichloroethene	liver/kidney	113		—	113
								Vinyl chloride (Chloroethene)	liver	7		—	7
								SVOCs					
								bis(2-Ethylhexyl)phthalate	liver	0.05		0.003	0.06
								Inorganics					
								Chromium	none	1		0.09	1
								Cyanide, Total	CNS/thyroid/body weight	0.03		0.00006	0.03
								Iron	liver	1		0.002	1
								Manganese	CNS	0.3		0.01	0.3
								Nickel	body weight	0.2		0.01	0.2
								Pesticides					
								beta-BHC	liver/kidney	0.005		0.0001	0.005
								Dieldrin	liver	0.07		0.002	0.08
			(Total)	NA	NA	NA	NA	(Total)		125	NA	0.1	126
Groundwater	Air	Groundwater Water Vapors at Showerhead Off-Site Surficial Aquifer						*VOCs*					
								1,1-Dichloroethene	liver		0.003		0.003
								Benzene	ND		0.03		0.03
								cis-1,2-Dichloroethene	NA		—		—
								Trichloroethene	NA		—		—
								Vinyl chloride (Chloroethene)	liver		0.7		0.7
			(Total)	NA	NA	NA	NA	(Total)		NA	0.7	NA	0.7

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Table 6-26
Summary of Receptor Risks and Hazards For COPCs
Reasonable Maximum Exposure
Future Resident Child — Surface Soil (Exposed Soil Only), Sediment and Surface Water — Mill Pond, and Groundwater — Off-Site Surficial Aquifer
Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report
Baseline Human Health Risk Assessment
Former Thompson Industries Site
Madison, Florida

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Child

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk			
				Ingestion	Inhalation	Dermal	Exposure Routes Total
						Total Risk Across Exposed Surface Soil	NA
						Total Risk Across Sediment — Mill Pond	NA
						Total Risk Across Surface Water — Mill Pond	NA
						Total Risk Across Groundwater — Off-Site Surficial Aquifer	NA
						Total Risk Across All Media and All Exposure Routes	NA

Chemical	Non-Carcinogenic Hazard Quotient				
	Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
				Total Hazard Index Across Exposed Surface Soil	4
				Total Hazard Index Across Sediment — Mill Pond	0.07
				Total Hazard Index Across Surface Water — Mill Pond	13
				Total Hazard Index Across Groundwater — Off-Site Surficial Aquifer	126
				Total Hazard Index Across All Media and All Exposure Routes	143

NA - Not Applicable
ND - No Data
CNS - Central Nervous System

Target Organ HI per Medium

Organ	Soil	Sediment	Surface Water	Groundwater		
blood	NA	NA	0.0009	3	Total blood HI	3
body weight	0.01	NA	NA	0.3	Total body weight HI	0.3
CNS	2	NA	NA	0.3	Total CNS HI	2
eye	NA	NA	NA	NA	Total eye HI	NA
gastrointestinal	0.08	NA	NA	NA	Total gastrointestinal HI	0.08
kidney	0.02	NA	0.5	113	Total kidney HI	114
liver	0.4	NA	13	121	Total liver HI	135
lungs	0.003	NA	NA	NA	Total lungs HI	0.003
nose	0.3	NA	NA	NA	Total nose HI	0.3
skin	0.1	NA	NA	NA	Total skin HI	0.1
thyroid	NA	NA	NA	0.03	Total thyroid HI	0.03
none/ND	0.9	0.07	NA	1	Total none/ND HI	2

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Table 6-27
Summary of Receptor Risks and Hazards For COPCs
Reasonable Maximum Exposure
Future Resident Child — Surface Soil, Sediment and Surface Water — Mill Pond, and Groundwater — Off-Site Surficial Aquifer
Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report
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Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Child

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	Surface Soil						*VOCs*					
								2-Methylnaphthalene	body weight	0.004		0.0004	0.004
								Naphthalene	body weight	0.03		0.002	0.03
								Xylenes (total)	CNS	0.0001		0.000009	0.0001
								SVOCs					
								Benzo(a)pyrene	NA	—		—	—
								bis(2-Ethylhexyl)phthalate	liver	0.005		0.0005	0.006
								Inorganics					
								Aluminum	CNS	0.1		0.001	0.1
								Arsenic	skin	0.08		0.0007	0.08
								Barium	kidney	0.01		0.001	0.01
								Chromium	none	1		0.4	1
								Copper	gastrointestinal	0.07		0.0006	0.07
								Iron	liver	0.4		0.004	0.4
								Lead	NA	—		—	—
								Manganese	CNS	0.05		0.01	0.07
								Nickel	body weight	0.03		0.008	0.04
								Thallium	blood	0.1		0.0009	0.1
								Vanadium	ND	0.02		0.009	0.03
								Zinc	blood	0.06		0.0006	0.06
								Pesticides					
								4,4'-DDT	liver	0.03		0.003	0.04
								PCBs					
								Aroclor 1260	eye	0.2		0.02	0.2
			(Total)	NA	NA	NA	NA	(Total)		2	NA	0.4	3

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Table 6-27
Summary of Receptor Risks and Hazards For COPCs
Reasonable Maximum Exposure
Future Resident Child — Surface Soil, Sediment and Surface Water — Mill Pond, and Groundwater — Off-Site Surficial Aquifer
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Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Child

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Air	Particulates from Surface Soil						*SVOCs*					
								Benzo(a)pyrene	NA		—		—
								bis(2-Ethylhexyl)phthalate	NA		—		—
								Inorganics					
								Aluminum	ND		0.006		0.006
								Arsenic	NA		—		—
								Barium	NA		—		—
								Chromium	lungs		0.005		0.005
								Copper	NA		—		—
								Iron	NA		—		—
								Lead	NA		—		—
								Manganese	CNS		0.004		0.004
								Nickel	NA		—		—
								Thallium	NA		—		—
								Vanadium	NA		—		—
								Zinc	NA		—		—
								Pesticides					
								4,4'-DDT	NA		—		—
								PCBs					
								Aroclor 1260	NA		—		—
			(Total)	NA	NA	NA	NA	(Total)		NA	0.01	NA	0.01
	Air	Vapors from Surface Soil						*VOCs*					
								2-Methylnaphthalene	nose		0.1		0.1
								Naphthalene	nose		0.7		0.7
								Xylenes (total)	NA		—		—
			(Total)	NA	NA	NA	NA	(Total)		NA	0.8	NA	0.8

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Table 6-27
Summary of Receptor Risks and Hazards For COPCs
Reasonable Maximum Exposure
Future Resident Child — Surface Soil, Sediment and Surface Water — Mill Pond, and Groundwater — Off-Site Surficial Aquifer
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Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Child

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Sediment	Sediment	Sediment Mill Pond						*Inorganics*					
								Vanadium	ND	0.05		0.02	0.07
			(Total)	NA	NA	NA	NA	(Total)		0.05	NA	0.02	0.07
Surface Water	Surface Water	Surface Water Mill Pond						*VOCs*					
								cis-1,2-Dichloroethene	blood	0.0002		0.00007	0.0003
								Vinyl chloride (Chloroethene)	liver	0.008		0.002	0.01
								SVOCs					
								bis(2-Ethylhexyl)phthalate	liver	0.003		0.004	0.007
								Inorganics					
								Iron	liver	0.007		0.0004	0.008
								Pesticides					
			(Total)	NA	NA	NA	NA	beta-BHC	liver/kidney	0.001		0.0007	0.002
								(Total)		0.02	NA	0.007	0.03
	Animal Tissue	Surface Water Mill Pond						*VOCs*					
								cis-1,2-Dichloroethene	blood	0.0007			0.0007
								Vinyl chloride (Chloroethene)	liver	0.01			0.01
								SVOCs					
								bis(2-Ethylhexyl)phthalate	liver	9			9
								Inorganics					
								Iron	liver	3			3
								Pesticides					
			(Total)	NA	NA	NA	NA	beta-BHC	liver/kidney	0.5			0.5
								(Total)		13	NA	NA	13

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Table 6-27
Summary of Receptor Risks and Hazards For COPCs
Reasonable Maximum Exposure
Future Resident Child — Surface Soil, Sediment and Surface Water — Mill Pond, and Groundwater — Off-Site Surficial Aquifer
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Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Child

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary - Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Groundwater	Groundwater - Off-Site Surficial Aquifer						*VOCs*					
								1,1-Dichloroethene	liver	0.003		—	0.003
								Benzene	ND	0.02		—	0.02
								cis-1,2-Dichloroethene	blood	3		—	3
								Trichloroethene	liver/kidney	113		—	113
								Vinyl chloride (Chloroethene)	liver	7		—	7
								SVOCs					
								bis(2-Ethylhexyl)phthalate	liver	0.05		0.003	0.06
								Inorganics					
								Chromium	none	1		0.09	1
								Cyanide, Total	CNS/thyroid/body weight	0.03		0.00006	0.03
								Iron	liver	1		0.002	1
								Manganese	CNS	0.3		0.01	0.3
								Nickel	body weight	0.2		0.01	0.2
								Pesticides					
								beta-BHC	liver/kidney	0.005		0.0001	0.005
								Dieldrin	liver	0.07		0.002	0.08
			(Total)	NA	NA	NA	NA	(Total)		125	NA	0.1	126
	Air	Groundwater Water Vapors at Showerhead Off-Site Surficial Aquifer						*VOCs*					
								1,1-Dichloroethene	liver		0.003		0.003
								Benzene	ND		0.03		0.03
								cis-1,2-Dichloroethene	NA		—		—
								Trichloroethene	NA		—		—
								Vinyl chloride (Chloroethene)	liver		0.7		0.7
			(Total)	NA	NA	NA	NA	(Total)		NA	0.7	NA	0.7

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Table 6-27
Summary of Receptor Risks and Hazards For COPCs
Reasonable Maximum Exposure
Future Resident Child — Surface Soil, Sediment and Surface Water — Mill Pond, and Groundwater — Off-Site Surficial Aquifer
Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report
Baseline Human Health Risk Assessment
Former Thompson Industries Site
Madison, Florida

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Child

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
						Total Risk Across Surface Soil	NA					Total Hazard Index Across Surface Soil	4
						Total Risk Across Sediment — Mill Pond	NA					Total Hazard Index Across Sediment — Mill Pond	0.07
						Total Risk Across Surface Water — Mill Pond	NA					Total Hazard Index Across Surface Water — Mill Pond	13
						Total Risk Across Groundwater — Off-Site Surficial Aquifer	NA					Total Hazard Index Across Groundwater — Off-Site Surficial Aquifer	126
						Total Risk Across All Media and All Exposure Routes	NA					Total Hazard Index Across All Media and All Exposure Routes	143

NA - Not Applicable
ND - No Data
CNS - Central Nervous System

Target Organ HI per Medium

Organ	Soil	Sediment	Surface Water	Groundwater	
blood	0.2	NA	0.0009	3	Total blood HI 3
body weight	0.07	NA	NA	0.3	Total body weight HI 0.3
CNS	0.2	NA	NA	0.3	Total CNS HI 0.5
eye	0.2	NA	NA	NA	Total eye HI 0.2
gastrointestinal	0.07	NA	NA	NA	Total gastrointestinal HI 0.07
kidney	0.01	NA	0.5	113	Total kidney HI 114
liver	0.4	NA	13	121	Total liver HI 135
lungs	0.005	NA	NA	NA	Total lungs HI 0.005
nose	0.8	NA	NA	NA	Total nose HI 0.8
skin	0.08	NA	NA	NA	Total skin HI 0.08
thyroid	NA	NA	NA	0.03	Total thyroid HI 0.03
none/ND	1	0.07	NA	1	Total none/ND HI 3

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Table 6-28
Summary of Receptor Risks and Hazards For COPCs
Reasonable Maximum Exposure
Future Resident Child — Subsurface Soil (Exposed Soil Only), Sediment and Surface Water — Mill Pond, and Groundwater — Off-Site Surficial Aquifer
Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report
Baseline Human Health Risk Assessment
Former Thompson Industries Site
Madison, Florida

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Child

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Route Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Route Total
Subsurface Soil	Subsurface Soil	Exposed Subsurface Soil						*VOCs*					
								Naphthalene	body weight	0.01		0.001	0.01
								Inorganics					
								Aluminum	CNS	0.7		0.007	0.7
								Arsenic	skin	0.06		0.0006	0.07
								Barium	kidney	0.01		0.002	0.01
								Chromium	none	2.6		0.2	0.8
								Copper	gastrointestinal	0.08		0.0007	0.08
								Iron	liver	0.2		0.002	0.2
								Vanadium	ND	0.04		0.01	0.05
			(Total)	NA	NA	NA	NA		(Total)	2	NA	0.2	2
	Air	Particulates from Exposed Subsurface Soil						*Inorganics*					
								Aluminum	ND		0.03		0.03
								Arsenic	NA		—		—
								Barium	NA		—		—
								Chromium	lungs		0.003		0.003
								Copper	NA		—		—
								Iron	NA		—		—
								Vanadium	NA		—		—
			(Total)	NA	NA	NA	NA		(Total)	NA	0.04	NA	0.04
	Air	Vapors from Exposed Subsurface Soil						*VOCs*					
								Naphthalene	none		0.3		0.3
			(Total)	NA	NA	NA	NA		(Total)	NA	0.3	NA	0.3
Sediment	Sediment	Sediment Mill Pond						*Inorganics*					
								Vanadium	ND	0.05		0.02	0.07
			(Total)	NA	NA	NA	NA		(Total)	0.05	NA	0.02	0.07
Surface Water	Surface Water	Surface Water Mill Pond						*VOCs*					
								cis-1,2-Dichloroethene	blood	0.0002		0.00007	0.0003
								Vinyl chloride (Chloroethene)	liver	0.008		0.002	0.01
								SVOCs					
								bis(2-Ethylhexyl)phthalate	liver	0.003		0.004	0.007
								Inorganics					
								Iron	liver	0.007		0.0004	0.008
								Pesticides					
								beta-BHC	liver/kidney	0.001		0.0007	0.002
			(Total)	NA	NA	NA	NA		(Total)	0.02	NA	0.007	0.03

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Table 6-28
Summary of Receptor Risks and Hazards For COPCs
Reasonable Maximum Exposure
Future Resident Child — Subsurface Soil (Exposed Soil Only), Sediment and Surface Water — Mill Pond, and Groundwater — Off-Site Surficial Aquifer
Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report
Baseline Human Health Risk Assessment
Former Thompson Industries Site
Madison, Florida

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Child

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Water	Animal Tissue	Fish Tissue from Mill Pond						*VOCs*					
								cis-1,2-Dichloroethene	blood	0.0007			0.0007
								Vinyl chloride (Chloroethene)	liver	0.01			0.01
								SVOCs					
								bis(2-Ethylhexyl)phthalate	liver	9			9
								Inorganics					
								Iron	liver	3			3
								Pesticides					
								beta-BHC	liver/kidney	0.5			0.5
			(Total)	NA	NA	NA	NA	(Total)		13	NA	NA	13
Groundwater	Groundwater	Groundwater Off-Site Surficial Aquifer						*VOCs*					
								1,1-Dichloroethene	liver	0.003		—	0.003
								Benzene	ND	0.02		—	0.02
								cis-1,2-Dichloroethene	blood	3		—	3
								Trichloroethene	liver/kidney	113		—	113
								Vinyl chloride (Chloroethene)	liver	7		—	7
								SVOCs					
								bis(2-Ethylhexyl)phthalate	liver	0.05		0.003	0.06
								Inorganics					
								Chromium	none	1		0.09	1
								Cyanide, Total	CNS/thyroid/body weigh	0.03		0.00006	0.03
								Iron	liver	1		0.002	1
								Manganese	CNS	0.3		0.01	0.3
								Nickel	body weight	0.2		0.01	0.2
								Pesticides					
								beta-BHC	liver/kidney	0.005		0.0001	0.005
								Dieldrin	liver	0.07		0.002	0.08
			(Total)	NA	NA	NA	NA	(Total)		125	NA	0.1	126
	Air	Groundwater Water Vapors at Showerhead Off-Site Surficial Aquifer						*VOCs*					
								1,1-Dichloroethene	liver		0.003		0.003
								Benzene	ND		0.03		0.03
								cis-1,2-Dichloroethene	NA		—		—
								Trichloroethene	NA		—		—
								Vinyl chloride (Chloroethene)	liver		0.7		0.7
			(Total)	NA	NA	NA	NA	(Total)		NA	0.7	NA	0.7

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Table 6-28
Summary of Receptor Risks and Hazards For COPCs
Reasonable Maximum Exposure
Future Resident Child — Subsurface Soil (Exposed Soil Only), Sediment and Surface Water — Mill Pond, and Groundwater — Off-Site Surficial Aquifer
Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report
Baseline Human Health Risk Assessment
Former Thompson Industries Site
Madison, Florida

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Child

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total

	Carcinogenic Risk		Non-Carcinogenic Hazard
Total Risk Across Exposed Subsurface Soil	NA	Total Hazard Index Across Exposed Subsurface Soil	2
Total Risk Across Sediment — Mill Pond	NA	Total Hazard Index Across Sediment — Mill Pond	0.07
Total Risk Across Surface Water — Mill Pond	NA	Total Hazard Index Across Surface Water — Mill Pond	13
Total Risk Across Groundwater — Off-Site Surficial Aquifer	NA	Total Hazard Index Across Groundwater — Off-Site Surficial Aquifer	126
Total Risk Across All Media and All Exposure Routes	NA	Total Hazard Index Across All Media and All Exposure Routes	142

NA - Not Applicable
ND - No Data
CNS - Central Nervous System

Target Organ HI per Medium

Organ	Soil	Sediment	Surface Water	Groundwater		
blood	NA	NA	0.0009	3	Total blood HI	3
body weight	0.01	NA	NA	0.3	Total body weight HI	0.3
CNS	0.7	NA	NA	0.3	Total CNS HI	1
eye	NA	NA	NA	NA	Total eye HI	NA
gastrointestinal	0.08	NA	NA	NA	Total gastrointestinal HI	0.08
kidney	0.01	NA	0.5	113	Total kidney HI	114
liver	0.2	NA	13	121	Total liver HI	135
lungs	0.003	NA	NA	NA	Total lungs HI	0.003
nose	0.3	NA	NA	NA	Total nose HI	0.3
skin	0.07	NA	NA	NA	Total skin HI	0.07
thyroid	NA	NA	NA	0.03	Total thyroid HI	0.03
none/ND	0.9	0.07	NA	1	Total none/ND HI	2

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Table 6-29
Summary of Receptor Risks and Hazards For COPCs
Reasonable Maximum Exposure
Future Resident Child — Subsurface Soil, Sediment and Surface Water — Mill Pond, and Groundwater — Off-Site Surficial Aquifer
Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report
Baseline Human Health Risk Assessment
Former Thompson Industries Site
Madison, Florida

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Child

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Subsurface Soil	Subsurface Soil	Subsurface Soil						*VOCs*					
								2-Methylnaphthalene	body weight	0.002		0.0002	0.002
								cis-1,2-Dichloroethene	blood	0.001		0.0001	0.001
								Naphthalene	body weight	0.007		0.0006	0.008
								Vinyl chloride (Chloroethene)	liver	0.001		0.0001	0.001
								Xylenes (total)	CNS	0.00008		0.000008	0.00009
								SVOCs					
								Benzo(a)pyrene	NA	—		—	—
								bis(2-Ethylhexyl)phthalate	liver	0.002		0.0002	0.003
								Inorganics					
								Aluminum	CNS	0.09		0.0008	0.09
								Antimony	blood	0.01		0.0009	0.02
								Arsenic	skin	0.06		0.0005	0.06
								Barium	kidney	0.008		0.001	0.01
								Chromium	none	0.4		0.2	0.6
								Copper	gastrointestinal	0.02		0.0002	0.02
								Iron	liver	0.3		0.002	0.3
								Lead	NA	—		—	—
								Manganese	CNS	0.04		0.01	0.05
								Nickel	body weight	0.01		0.003	0.02
								Thallium	blood	0.08		0.0007	0.08
								Vanadium	ND	0.02		0.007	0.03
								Zinc	blood	0.03		0.0003	0.03
								Pesticides					
								4,4'-DDT	liver	0.005		0.0005	0.005
								PCBs					
			(Total)	NA	NA	NA	NA	Aroclor 1260	eye	0.1		0.01	0.1
								(Total)		1	NA	0.2	1

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Table 6-29
Summary of Receptor Risks and Hazards For COPCs
Reasonable Maximum Exposure
Future Resident Child — Subsurface Soil, Sediment and Surface Water — Mill Pond, and Groundwater — Off-Site Surficial Aquifer
Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report
Baseline Human Health Risk Assessment
Former Thompson Industries Site
Madison, Florida

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Child

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Subsurface Soil	Air	Particulates from Subsurface Soil						*SVOCs*					
								Benzo(a)pyrene	NA		—		—
								bis(2-Ethylhexyl)phthalate	NA		—		—
								Inorganics					
								Aluminum	ND		0.004		0.004
								Antimony	NA		—		—
								Arsenic	NA		—		—
								Barium	NA		—		—
								Chromium	lungs		0.002		0.002
								Copper	NA		—		—
								Iron	NA		—		—
								Lead	NA		—		—
								Manganese	CNS		0.003		0.003
								Nickel	NA		—		—
								Thallium	NA		—		—
								Vanadium	NA		—		—
								Zinc	NA		—		—
								Pesticides					
								4,4'-DDT	NA		—		—
								PCBs					
								Aroclor 1260	NA		—		—
			(Total)	NA	NA	NA	NA	(Total)		NA	0.009	NA	0.009
	Air	Vapors from Subsurface Soil						*VOCs*					
								2-Methylnaphthalene	nose		0.05		0.05
								cis-1,2-Dichloroethene	NA		—		—
								Naphthalene	nose		0.2		0.2
								Vinyl chloride (Chloroethene)	liver		0.008		0.008
								Xylenes (total)	NA		—		—
			(Total)	NA	NA	NA	NA	(Total)		NA	0.3	NA	0.3

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Table 6-29
Summary of Receptor Risks and Hazards For COPCs
Reasonable Maximum Exposure
Future Resident Child — Subsurface Soil, Sediment and Surface Water — Mill Pond, and Groundwater — Off-Site Surficial Aquifer
Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report
Baseline Human Health Risk Assessment
Former Thompson Industries Site
Madison, Florida

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Child

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Sediment	Sediment	Sediment Mill Pond						*Inorganics*					
								Vanadium	ND	0.05		0.02	0.07
			(Total)	NA	NA	NA	NA	(Total)		0.05	NA	0.02	0.07
Surface Water	Surface Water	Surface Water Mill Pond						*VOCs*					
								cis-1,2-Dichloroethene	blood	0.0002		0.00007	0.0003
								Vinyl chloride (Chloroethene)	liver	0.008		0.002	0.01
								SVOCs					
								bis(2-Ethylhexyl)phthalate	liver	0.003		0.004	0.007
								Inorganics					
								Iron	liver	0.007		0.0004	0.008
								Pesticides					
								beta-BHC	liver/kidney	0.001		0.0007	0.002
			(Total)	NA	NA	NA	NA	(Total)		0.02	NA	0.007	0.03
	Animal Tissue	Fish from Mill Pond						*VOCs*					
								cis-1,2-Dichloroethene	blood	0.0007			0.0007
								Vinyl chloride (Chloroethene)	liver	0.01			0.01
								SVOCs					
								bis(2-Ethylhexyl)phthalate	liver	9			9
								Inorganics					
								Iron	liver	3			3
								Pesticides					
								beta-BHC	liver/kidney	0.5			0.5
			(Total)	NA	NA	NA	NA	(Total)		13	NA	NA	13

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Table 6-29
Summary of Receptor Risks and Hazards For COPCs
Reasonable Maximum Exposure
Future Resident Child — Subsurface Soil, Sediment and Surface Water — Mill Pond, and Groundwater — Off-Site Surficial Aquifer
Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report
Baseline Human Health Risk Assessment
Former Thompson Industries Site
Madison, Florida

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Child

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Groundwater	Groundwater - Off-Site Surficial Aquifer						*VOCs*					
								1,1-Dichloroethene	liver	0.003		—	0.003
								Benzene	ND	0.02		—	0.02
								cis-1,2-Dichloroethene	blood	3		—	3
								Trichloroethene	liver/kidney	113		—	113
								Vinyl chloride (Chloroethene)	liver	7		—	7
								SVOCs					
								bis(2-Ethylhexyl)phthalate	liver	0.05		0.003	0.06
								Inorganics					
								Chromium	none	1		0.09	1
								Cyanide, Total	CNS/thyroid/body weight	0.03		0.00006	0.03
								Iron	liver	1		0.002	1
								Manganese	CNS	0.3		0.01	0.3
								Nickel	body weight	0.2		0.01	0.2
								Pesticides					
								beta-BHC	liver/kidney	0.005		0.0001	0.005
								Dieldrin	liver	0.07		0.002	0.08
			(Total)	NA	NA	NA	NA	(Total)		125	NA	0.12	126
	Air	Groundwater Water Vapors at Showerhead Off-Site Surficial Aquifer						*VOCs*					
								1,1-Dichloroethene	liver		0.003		0.003
								Benzene	ND		0.03		0.03
								cis-1,2-Dichloroethene	NA		—		—
								Trichloroethene	NA		—		—
								Vinyl chloride (Chloroethene)	liver		0.7		0.7
			(Total)	NA	NA	NA	NA	(Total)		NA	0.7	NA	0.7

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Table 6-29
Summary of Receptor Risks and Hazards For COPCs
Reasonable Maximum Exposure
Future Resident Child — Subsurface Soil, Sediment and Surface Water — Mill Pond, and Groundwater — Off-Site Surficial Aquifer
Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report
Baseline Human Health Risk Assessment
Former Thompson Industries Site
Madison, Florida

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Child

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
						Total Risk Across Subsurface Soil	NA					Total Hazard Index Across Subsurface Soil	2
						Total Risk Across Sediment — Mill Pond	NA					Total Hazard Index Across Sediment — Mill Pond	0.07
						Total Risk Across Surface Water — Mill Pond	NA					Total Hazard Index Across Surface Water — Mill Pond	13
						Total Risk Across Groundwater — Off-Site Surficial Aquifer	NA					Total Hazard Index Across Groundwater — Off-Site Surficial Aquifer	126
						Total Risk Across All Media and All Exposure Routes	NA					Total Hazard Index Across All Media and All Exposure Routes	141

NA - Not Applicable
ND - No Data
CNS - Central Nervous System

Target Organ HI per Medium

Organ	Soil	Sediment	Surface Water	Groundwater		
blood	0.1	NA	0.0009	3	Total blood HI	3
body weight	0.03	NA	NA	0.3	Total body weight HI	0.3
CNS	0.1	NA	NA	0.3	Total CNS HI	0.4
eye	0.1	NA	NA	NA	Total eye HI	0.1
gastrointestinal	0.02	NA	NA	NA	Total gastrointestinal HI	0.02
kidney	0.01	NA	0.5	113	Total kidney HI	114
liver	0.3	NA	13	121	Total liver HI	135
lungs	0.002	NA	NA	NA	Total lungs HI	0.002
nose	0.2	NA	NA	NA	Total nose HI	0.2
skin	0.06	NA	NA	NA	Total skin HI	0.06
thyroid	NA	NA	NA	0.03	Total thyroid HI	0.03
none/ND	0.6	0.07	NA	1	Total none/ND HI	2

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Table 6-30
Summary of Receptor Risks and Hazards For COPCs
Reasonable Maximum Exposure
Future Resident Child — Surface Soil (Exposed Soil Only), Sediment and Surface Water — Mill Pond, and Groundwater — Off-Site Floridan Aquifer
Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report
Baseline Human Health Risk Assessment
Former Thompson Industries Site
Madison, Florida

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Child

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	Exposed Surface Soil						*VOCs*					
								Naphthalene	body weight	0.01		0.001	0.01
								Inorganics					
								Aluminum	CNS	2		0.02	2
								Arsenic	skin	0.1		0.001	0.1
								Barium	kidney	0.01		0.002	0.02
								Chromium	nose	0.6		0.2	0.8
								Copper	gastrointestinal	0.08		0.0007	0.08
								Iron	liver	0.4		0.004	0.4
								Vanadium	ND	0.04		0.01	0.06
			(Total)	NA	NA	NA	NA		(Total)	3	NA	0.3	3
	Air	Particulates from Exposed Surface Soil						*Inorganics*					
								Aluminum	ND		0.09		0.09
								Arsenic	NA		—		—
								Barium	NA		—		—
								Chromium	lungs		0.003		0.003
								Copper	NA		—		—
								Iron	NA		—		—
								Vanadium	NA		—		—
			(Total)	NA	NA	NA	NA		(Total)		NA	0.09	NA	0.09
	Air	Vapors from Exposed Surface Soil						*VOCs*					
								Naphthalene	nose		0.3		0.3
			(Total)	NA	NA	NA	NA		(Total)		NA	0.3	NA	0.3
Sediment	Sediment	Sediment Mill Pond						*Inorganics*					
								Vanadium	ND	0.05		0.02	0.07
			(Total)	NA	NA	NA	NA		(Total)	0.05	NA	0.02	0.07
Surface Water	Surface Water	Surface Water Mill Pond						*VOCs*					
								cis-1,2-Dichloroethene	blood	0.0002		0.00007	0.0003
								Vinyl chloride (Chloroethene)	liver	0.008		0.002	0.01
								SVOCs					
								bis(2-Ethylhexyl)phthalate	liver	0.003		0.004	0.007
								Inorganics					
								Iron	liver	0.007		0.0004	0.008
								Pesticides					
								beta-BHC	liver/kidney	0.001		0.0007	0.002
			(Total)	NA	NA	NA	NA		(Total)	0.02	NA	0.007	0.03

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Table 6-30
Summary of Receptor Risks and Hazards For COPCs
Reasonable Maximum Exposure
Future Resident Child — Surface Soil (Exposed Soil Only), Sediment and Surface Water — Mill Pond, and Groundwater — Off-Site Floridan Aquifer
Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report
Baseline Human Health Risk Assessment
Former Thompson Industries Site
Madison, Florida

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Child

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Water	Animal Tissue	Fish Tissue from Mill Pond						*VOCs*					
								cis-1,2-Dichloroethene	blood	0.0007			0.0007
								Vinyl chloride (Chloroethene)	liver	0.01			0.01
								SVOCs					
								bis(2-Ethylhexyl)phthalate	liver	9			9
								Inorganics					
								Iron	liver	3			3
								Pesticides					
								beta-BHC	liver/kidney	0.5			0.5
			(Total)	NA	NA	NA	NA	(Total)		13	NA	NA	13
Groundwater	Groundwater	Groundwater Off-Site Floridan Aquifer						*VOCs*					
								1,1-Dichloroethane	liver	0.0009		—	0.0009
								Chloroform	liver	0.001		—	0.001
								cis-1,2-Dichloroethene	blood	1		—	1
								Trichloroethene	liver/kidney	46		—	46
								Vinyl chloride (Chloroethane)	liver	0.005		—	0.005
								SVOCs					
								bis(2-Ethylhexyl)phthalate	liver	0.04		0.001	0.04
								Inorganics					
								Chromium	none	0.3		0.03	0.4
			(Total)	NA	NA	NA	NA	(Total)		48	NA	0.03	48
	Air	Groundwater Water Vapors at Showerhead Off-Site Floridan Aquifer						*VOCs*					
								1,1-Dichloroethane	liver		0.0008		0.0008
								Chloroform	ND		0.1		0.1
								cis-1,2-Dichloroethene	NA		—		—
								Trichloroethene	NA		—		—
								Vinyl chloride (Chloroethane)	liver		0.0005		0.0005
			(Total)	NA	NA	NA	NA	(Total)		NA	0.1	NA	0.1

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Table 6-30
Summary of Receptor Risks and Hazards For COPCs
Reasonable Maximum Exposure
Future Resident Child — Surface Soil (Exposed Soil Only), Sediment and Surface Water — Mill Pond, and Groundwater — Off-Site Floridan Aquifer
Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report
Baseline Human Health Risk Assessment
Former Thompson Industries Site
Madison, Florida

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Child

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
						Total Risk Across Exposed Surface Soil	NA					Total Hazard Index Across Exposed Surface Soil	4
						Total Risk Across Sediment — Mill Pond	NA					Total Hazard Index Across Sediment — Mill Pond	0.07
						Total Risk Across Surface Water — Mill Pond	NA					Total Hazard Index Across Surface Water — Mill Pond	13
						Total Risk Across Groundwater — Off-Site Floridan Aquifer	NA					Total Hazard Index Across Groundwater — Off-Site Floridan Aquifer	48
						Total Risk Across All Media and All Exposure Routes	NA					Total Hazard Index Across All Media and All Exposure Routes	65

NA - Not Applicable
ND - No Data
CNS - Central Nervous System

Target Organ HI per Medium

Organ	Soil	Sediment	Surface Water	Groundwater	
blood	NA	NA	0.0009	1	Total blood HI: 1
body weight	0.01	NA	NA	NA	Total body weight HI: 0.01
CNS	2	NA	NA	NA	Total CNS HI: 2
eye	NA	NA	NA	NA	Total eye HI: NA
gastrointestinal	0.08	NA	NA	NA	Total gastrointestinal HI: 0.08
kidney	0.02	NA	0.5	46	Total kidney HI: 47
liver	0.4	NA	13	47	Total liver HI: 60
lungs	0.003	NA	NA	NA	Total lungs HI: 0.003
nose	0.3	NA	NA	NA	Total nose HI: 0.3
skin	0.1	NA	NA	NA	Total skin HI: 0.1
thyroid	NA	NA	NA	NA	Total thyroid HI: NA
none/ND	0.9	0.07	NA	0.5	Total none/ND HI: 1

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Table 6-31
Summary of Receptor Risks and Hazards For COPCs
Reasonable Maximum Exposure
Future Resident Child — Surface Soil, Sediment and Surface Water — Mill Pond, and Groundwater — Off-Site Floridan Aquifer
Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report
Baseline Human Health Risk Assessment
Former Thompson Industries Site
Madison, Florida

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Child

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	Surface Soil						***VOCs***					
								2-Methylnaphthalene	body weight	0.004		0.0004	0.004
								Naphthalene	body weight	0.03		0.002	0.03
								Xylenes (total)	CNS	0.0001		0.000009	0.0001
								SVOCs					
								Benzo(a)pyrene	NA	—		—	—
								bis(2-Ethylhexyl)phthalate	liver	0.005		0.0005	0.006
								Inorganics					
								Aluminum	CNS	0.1		0.001	0.1
								Arsenic	skin	0.08		0.0007	0.08
								Barium	kidney	0.01		0.001	0.01
								Chromium	none	1		0.4	1
								Copper	gastrointestinal	0.07		0.0006	0.07
								Iron	liver	0.4		0.004	0.4
								Lead	NA	—		—	—
								Manganese	CNS	0.05		0.01	0.07
								Nickel	body weight	0.03		0.008	0.04
								Thallium	blood	0.1		0.0009	0.1
								Vanadium	ND	0.02		0.009	0.03
								Zinc	blood	0.06		0.0006	0.06
								Pesticides					
								4,4'-DDT	liver	0.03		0.003	0.04
								PCBs					
								Aroclor 1260	eye	0.2		0.02	0.2
			(Total)	NA	NA	NA	NA	(Total)		2	NA	0.4	3

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Table 6-31
Summary of Receptor Risks and Hazards For COPCs
Reasonable Maximum Exposure
Future Resident Child — Surface Soil, Sediment and Surface Water — Mill Pond, and Groundwater — Off-Site Floridan Aquifer
Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report
Baseline Human Health Risk Assessment
Former Thompson Industries Site
Madison, Florida

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Child

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Air	Particulates from Surface Soil						*SVOCs*					
								Benzo(a)pyrene	NA		—		—
								bis(2-Ethylhexyl)phthalate	NA		—		—
								Inorganics					
								Aluminum	ND		0.006		0.006
								Arsenic	NA		—		—
								Barium	NA		—		—
								Chromium	lungs		0.005		0.005
								Copper	NA		—		—
								Iron	NA		—		—
								Lead	NA		—		—
								Manganese	CNS		0.004		0.004
								Nickel	NA		—		—
								Thallium	NA		—		—
								Vanadium	NA		—		—
								Zinc	NA		—		—
								Pesticides					
								4,4'-DDT	NA		—		—
								PCBs					
								Aroclor 1260	NA		—		—
			(Total)	NA	NA	NA	NA	(Total)		NA	0.01	NA	0.01
	Air	Vapors from Surface Soil						*VOCs*					
								2-Methylnaphthalene	nose		0.1		0.1
								Naphthalene	nose		0.7		0.7
								Xylenes (total)	NA		—		—
			(Total)	NA	NA	NA	NA	(Total)		NA	0.8	NA	0.8

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Table 6-31
Summary of Receptor Risks and Hazards For COPCs
Reasonable Maximum Exposure
Future Resident Child — Surface Soil, Sediment and Surface Water — Mill Pond, and Groundwater — Off-Site Floridan Aquifer
Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report
Baseline Human Health Risk Assessment
Former Thompson Industries Site
Madison, Florida

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Child

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Sediment	Sediment	Sediment Mill Pond						*Inorganics*					
								Vanadium	ND	0.05		0.02	0.07
			(Total)	NA	NA	NA	NA	(Total)		0.05	NA	0.02	0.07
Surface Water	Surface Water	Surface Water Mill Pond						*VOCs*					
								cis-1,2-Dichloroethene	blood	0.0002		0.00007	0.0003
								Vinyl chloride (Chloroethene)	liver	0.008		0.002	0.01
								SVOCs					
								bis(2-Ethylhexyl)phthalate	liver	0.003		0.004	0.007
								Inorganics					
								Iron	liver	0.007		0.0004	0.008
								Pesticides					
								beta-BHC	liver/kidney	0.001		0.0007	0.002
			(Total)	NA	NA	NA	NA	(Total)		0.02	NA	0.007	0.03
	Animal Tissue	Surface Water Mill Pond						*VOCs*					
								cis-1,2-Dichloroethene	blood	0.0007			0.0007
								Vinyl chloride (Chloroethene)	liver	0.01			0.01
								SVOCs					
								bis(2-Ethylhexyl)phthalate	liver	9			9
								Inorganics					
								Iron	liver	3			3
								Pesticides					
								beta-BHC	liver/kidney	0.5			0.5
			(Total)	NA	NA	NA	NA	(Total)		13	NA	NA	13

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Table 6-31
Summary of Receptor Risks and Hazards For COPCs
Reasonable Maximum Exposure
Future Resident Child — Surface Soil, Sediment and Surface Water — Mill Pond, and Groundwater — Off-Site Floridan Aquifer
Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report
Baseline Human Health Risk Assessment
Former Thompson Industries Site
Madison, Florida

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Child

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Groundwater	Groundwater - Off-Site Floridan Aquifer						*VOCs*					
								1,1-Dichloroethene	liver	0.0009		—	0.0009
								Chloroform	liver	0.001		—	0.001
								cis-1,2-Dichloroethene	blood	1		—	1
								Trichloroethene	liver/kidney	46		—	46
								Vinyl chloride (Chloroethene)	liver	0.005		—	0.005
								SVOCs					
								bis(2-Ethylhexyl)phthalate	liver	0.04		0.002	0.04
								Inorganics					
								Chromium	none	0.3		0.03	0.4
			(Total)	NA	NA	NA	NA	(Total)		48	NA	0.03	48
	Air	Groundwater Water Vapors at Showerhead Off-Site Floridan Aquifer						*VOCs*					
								1,1-Dichloroethene	liver		0.0008		0.0008
								Chloroform	ND		0.1		0.1
								cis-1,2-Dichloroethene	NA		—		—
								Trichloroethene	NA		—		—
								Vinyl chloride (Chloroethene)	liver		0.0005		0.0005
			(Total)	NA	NA	NA	NA	(Total)		NA	0.1	NA	0.1

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Table 6-31
Summary of Receptor Risks and Hazards For COPCs
Reasonable Maximum Exposure
Future Resident Child — Surface Soil, Sediment and Surface Water — Mill Pond, and Groundwater — Off-Site Floridan Aquifer
Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report
Baseline Human Health Risk Assessment
Former Thompson Industries Site
Madison, Florida

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Child

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
						Total Risk Across Surface Soil	NA					Total Hazard Index Across Surface Soil	4
						Total Risk Across Sediment — Mill Pond	NA					Total Hazard Index Across Sediment — Mill Pond	0.07
						Total Risk Across Surface Water — Mill Pond	NA					Total Hazard Index Across Surface Water — Mill Pond	13
						Total Risk Across Groundwater — Off-Site Floridan Aquifer	NA					Total Hazard Index Across Groundwater — Off-Site Floridan Aquifer	48
						Total Risk Across All Media and All Exposure Routes	NA					Total Hazard Index Across All Media and All Exposure Routes	65

NA - Not Applicable
ND - No Data
CNS - Central Nervous System

Target Organ HI per Medium

Organ	Soil	Sediment	Surface Water	Groundwater	
blood	0.2	NA	0.0009	1	Total blood HI 1
body weight	0.07	NA	NA	NA	Total body weight HI 0.07
CNS	0.2	NA	NA	NA	Total CNS HI 0.2
eye	0.2	NA	NA	NA	Total eye HI 0.2
gastrointestinal	0.07	NA	NA	NA	Total gastrointestinal HI 0.07
kidney	0.01	NA	0.5	46	Total kidney HI 47
liver	0.4	NA	13	47	Total liver HI 60
lungs	0.005	NA	NA	NA	Total lungs HI 0.005
nose	0.8	NA	NA	NA	Total nose HI 0.8
skin	0.08	NA	NA	NA	Total skin HI 0.08
thyroid	NA	NA	NA	NA	Total thyroid HI NA
none/ND	1	0.07	NA	0.5	Total none/ND HI 2

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Table 6-32
Summary of Receptor Risks and Hazards For COPCs
Reasonable Maximum Exposure
Future Resident Child — Subsurface Soil (Exposed Soil Only), Sediment and Surface Water — Mill Pond, and Groundwater — Off-Site Floridan Aquifer
Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report
Baseline Human Health Risk Assessment
Former Thompson Industries Site
Madison, Florida

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Child

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Subsurface Soil	Subsurface Soil	Exposed Subsurface Soil						*VOCs*					
								Naphthalene	body weight	0.01		0.001	0.01
								Inorganics					
								Aluminum	CNS	0.7		0.007	0.7
								Arsenic	skin	0.06		0.0006	0.07
								Barium	kidney	0.01		0.002	0.01
								Chromium	none	0.6		0.2	0.8
								Copper	gastrointestinal	0.08		0.0007	0.08
								Iron	liver	0.2		0.002	0.2
								Vanadium	ND	0.04		0.01	0.05
			(Total)	NA	NA	NA	NA		(Total)	1	NA	0.2	1
	Air	Particulates from Exposed Subsurface Soil						*Inorganics*					
								Aluminum	ND		0.03		0.03
								Arsenic	NA		—		—
								Barium	NA		—		—
								Chromium	lungs		0.003		0.003
								Copper	NA		—		—
								Iron	NA		—		—
								Vanadium	NA		—		—
			(Total)	NA	NA	NA	NA		(Total)		NA	0.04	NA	0.04
	Air	Vapors from Exposed Subsurface Soil						*VOCs*					
								Naphthalene	nose		0.3		0.3
			(Total)	NA	NA	NA	NA		(Total)		NA	0.3	NA	0.3
Sediment	Sediment	Sediment Mill Pond						*Inorganics*					
								Vanadium	ND	0.05		0.02	0.07
			(Total)	NA	NA	NA	NA		(Total)	0.05	NA	0.02	0.07
Surface Water	Surface Water	Surface Water Mill Pond						*VOCs*					
								cis-1,2-Dichloroethene	blood	0.0001		0.00007	0.0003
								Vinyl chloride (Chloroethene)	liver	0.008		0.002	0.01
								SVOCs					
								bis(2-Ethylhexyl)phthalate	liver	0.003		0.004	0.007
								Inorganics					
								Iron	liver	0.007		0.0004	0.008
								Pesticides					
								beta-BHC	liver/kidney	0.001		0.0007	0.002
			(Total)	NA	NA	NA	NA		(Total)	0.02	NA	0.007	0.03

Table 6-32
Summary of Receptor Risks and Hazards For COPCs
Reasonable Maximum Exposure
Future Resident Child — Subsurface Soil (Exposed Soil Only), Sediment and Surface Water — Mill Pond, and Groundwater — Off-Site Floridan Aquifer
Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report
Baseline Human Health Risk Assessment
Former Thompson Industries Site
Madison, Florida

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Child

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Water	Animal Tissue	Fish from Mill Pond						VOCs					
								cis-1,2-Dichloroethene	blood	0.0007			0.0007
								Vinyl chloride (Chloroethene)	liver	0.01			0.01
								SVOCs					
								bis(2-Ethylhexyl)phthalate	liver	9			9
								Inorganics					
								Iron	liver	3			3
								Pesticides					
								beta-BHC	liver/kidney	0.5			0.5
			(Total)	NA	NA	NA	NA	(Total)		13	NA	NA	13
Groundwater	Groundwater	Groundwater - Off-Site Floridan Aquifer						VOCs					
								1,1-Dichloroethene	liver	0.0009		—	0.0009
								Chloroform	liver	0.001		—	0.001
								cis-1,2-Dichloroethene	blood	1		—	1
								Trichloroethene	liver/kidney	46		—	46
								Vinyl chloride (Chloroethene)	liver	0.005		—	0.005
								SVOCs					
								bis(2-Ethylhexyl)phthalate	liver	0.04		0.002	0.04
								Inorganics					
			(Total)	NA	NA	NA	NA	Chromium (Total)	none	0.3 48	NA	0.03 0.03	0.4 48
	Air	Groundwater Water Vapors at Showerhead Off-Site Floridan Aquifer						VOCs					
								1,1-Dichloroethene	liver		0.0008		0.0008
								Chloroform	ND		0.1		0.1
								cis-1,2-Dichloroethene	NA		—		—
								Trichloroethene	NA		—		—
								Vinyl chloride (Chloroethene)	liver		0.0005		0.0005
			(Total)	NA	NA	NA	NA	(Total)		NA	0.1	NA	0.1

Table 6-32
Summary of Receptor Risks and Hazards For COPCs
Reasonable Maximum Exposure
Future Resident Child — Subsurface Soil (Exposed Soil Only), Sediment and Surface Water — Mill Pond, and Groundwater — Off-Site Floridan Aquifer
Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report
Baseline Human Health Risk Assessment
Former Thompson Industries Site
Madison, Florida

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Child

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
						Total Risk Across Exposed Subsurface Soil	NA					Total Hazard Index Across Exposed Subsurface Soil	2
						Total Risk Across Sediment — Mill Pond	NA					Total Hazard Index Across Sediment — Mill Pond	0.07
						Total Risk Across Surface Water — Mill Pond	NA					Total Hazard Index Across Surface Water — Mill Pond	13
						Total Risk Across Groundwater — Off-Site Floridan Aquifer	NA					Total Hazard Index Across Groundwater — Off-Site Floridan Aquifer	48
						Total Risk Across All Media and All Exposure Routes	NA					Total Hazard Index Across All Media and All Exposure Routes	64

NA - Not Applicable
ND - No Data
CNS - Central Nervous System

Target Organ HI per Medium

Organs	Soil	Sediment	Surface Water	Groundwater		
blood	NA	NA	0.0009	1	Total blood HI	1
body weight	0.01	NA	NA	NA	Total body weight HI	0.01
CNS	0.7	NA	NA	NA	Total CNS HI	0.7
eye	NA	NA	NA	NA	Total eye HI	NA
gastrointestinal	0.08	NA	NA	NA	Total gastrointestinal HI	0.08
kidney	0.01	NA	0.5	46	Total kidney HI	47
liver	0.2	NA	13	47	Total liver HI	60
lungs	0.003	NA	NA	NA	Total lungs HI	0.003
nose	0.3	NA	NA	NA	Total nose HI	0.3
skin	0.07	NA	NA	NA	Total skin HI	0.07
thyroid	NA	NA	NA	NA	Total thyroid HI	NA
none/ND	0.9	0.07	NA	0.5	Total none/ND HI	1

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Table 6-33
Summary of Receptor Risks and Hazards For COPCs
Reasonable Maximum Exposure
Future Resident Child — Subsurface Soil, Sediment and Surface Water — Mill Pond, and Groundwater — Off-Site Floridan Aquifer
Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report
Baseline Human Health Risk Assessment
Former Thompson Industries Site
Madison, Florida

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Child

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Subsurface Soil	Subsurface Soil	Subsurface Soil						*VOCs*					
								2-Methylnaphthalene	body weight	0.002		0.0002	0.002
								cis-1,2-Dichloroethene	blood	0.001		0.0001	0.001
								Naphthalene	body weight	0.007		0.0006	0.008
								Vinyl chloride (Chloroethene)	liver	0.001		0.0001	0.001
								Xylenes (total)	CNS	0.00008		0.000008	0.00009
								SVOCs					
								Benzo(a)pyrene	NA	—		—	—
								bis(2-Ethylhexyl)phthalate	liver	0.002		0.0002	0.003
								Inorganics					
								Aluminum	CNS	0.09		0.0008	0.09
								Antimony	blood	0.01		0.0009	0.02
								Arsenic	skin	0.06		0.0005	0.06
								Barium	kidney	0.008		0.001	0.01
								Chromium	none	0.4		0.2	0.6
								Copper	gastrointestinal	0.02		0.0002	0.02
								Iron	liver	0.3		0.002	0.3
								Lead	NA	—		—	—
								Manganese	CNS	0.04		0.01	0.05
								Nickel	body weight	0.01		0.003	0.02
								Thallium	blood	0.08		0.0007	0.08
								Vanadium	ND	0.02		0.007	0.03
								Zinc	blood	0.03		0.0003	0.03
								Pesticides					
								4,4'-DDT	liver	0.005		0.0005	0.005
								PCBs					
			(Total)	NA	NA	NA	NA	Aroclor 1260	eye	0.1		0.01	0.1
								(Total)		1	NA	0.2	1

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Table 6-33
Summary of Receptor Risks and Hazards For COPCs
Reasonable Maximum Exposure
Future Resident Child — Subsurface Soil, Sediment and Surface Water — Mill Pond, and Groundwater — Off-Site Floridan Aquifer
Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report
Baseline Human Health Risk Assessment
Former Thompson Industries Site
Madison, Florida

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Child

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Subsurface Soil	Air	Particulates from Subsurface Soil						*SVOCs*					
								Benzo(a)pyrene	NA		—		—
								bis(2-Ethylhexyl)phthalate	NA		—		—
								Inorganics					
								Aluminum	ND		0.004		0.004
								Antimony	NA		—		—
								Arsenic	NA		—		—
								Barium	NA		—		—
								Chromium	lungs		0.002		0.002
								Copper	NA		—		—
								Iron	NA		—		—
								Lead	NA		—		—
								Manganese	CNS		0.003		0.003
								Nickel	NA		—		—
								Thallium	NA		—		—
								Vanadium	NA		—		—
								Zinc	NA		—		—
								Pesticides					
								4,4'-DDT	NA		—		—
								PCBs					
								Aroclor 1260	NA		—		—
			(Total)	NA	NA	NA	NA	(Total)		NA	0.009	NA	0.009
	Air	Vapors from Subsurface Soil						*VOCs*					
								2-Methylnaphthalene	nose		0.05		0.05
								cis-1,2-Dichloroethene	NA		—		—
								Naphthalene	nose		0.2		0.2
								Vinyl chloride (Chloroethene)	liver		0.008		0.008
								Xylenes (total)	NA		—		—
			(Total)	NA	NA	NA	NA	(Total)		NA	0.3	NA	0.3

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Table 6-33
Summary of Receptor Risks and Hazards For COPCs
Reasonable Maximum Exposure
Future Resident Child — Subsurface Soil, Sediment and Surface Water — Mill Pond, and Groundwater — Off-Site Floridan Aquifer
Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report
Baseline Human Health Risk Assessment
Former Thompson Industries Site
Madison, Florida

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Child

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Sediment	Sediment	Sediment Mill Pond						*Inorganics*					
			(Total)	NA	NA	NA	NA	Vanadium	ND	0.05		0.02	0.07
								(Total)		0.05	NA	0.02	0.07
Surface Water	Surface Water	Surface Water Mill Pond						*VOCs*					
								cis-1,2-Dichloroethene	blood	0.0002		0.00007	0.0003
								Vinyl chloride (Chloroethene)	liver	0.008		0.002	0.01
								SVOCs					
								bis(2-Ethylhexyl)phthalate	liver	0.003		0.004	0.007
								Inorganics					
								Iron	liver	0.007		0.0004	0.008
								Pesticides					
			(Total)	NA	NA	NA	NA	beta-BHC	liver/kidney	0.001		0.0007	0.002
								(Total)		0.02	NA	0.007	0.03
	Animal Tissue	Fish from Mill Pond						*VOCs*					
								cis-1,2-Dichloroethene	blood	0.0007			0.0007
								Vinyl chloride (Chloroethene)	liver	0.01			0.01
								SVOCs					
								bis(2-Ethylhexyl)phthalate	liver	9			9
								Inorganics					
								Iron	liver	3			3
								Pesticides					
			(Total)	NA	NA	NA	NA	beta-BHC	liver/kidney	0.5			0.5
								(Total)		13	NA	NA	13

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Table 6-33
Summary of Receptor Risks and Hazards For COPCs
Reasonable Maximum Exposure
Future Resident Child — Subsurface Soil, Sediment and Surface Water — Mill Pond, and Groundwater — Off-Site Floridan Aquifer
Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report
Baseline Human Health Risk Assessment
Former Thompson Industries Site
Madison, Florida

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Child

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Groundwater	Groundwater - Off-Site Floridan Aquifer						*VOCs*					
								1,1-Dichloroethene	liver	0.0009		—	0.0009
								Chloroform	liver	0.001		—	0.001
								cis-1,2-Dichloroethene	blood	1		—	1
								Trichloroethene	liver/kidney	46		—	46
								Vinyl chloride (Chloroethene)	liver	0.005		—	0.005
								SVOCs					
								bis(2-Ethylhexyl)phthalate	liver	0.04		0.002	0.04
								Inorganics					
								Chromium	none	0.3		0.03	0.4
			(Total)	NA	NA	NA	NA	(Total)		48	NA	0.03	48
	Air	Groundwater Water Vapors at Showerhead Off-Site Floridan Aquifer						*VOCs*					
								1,1-Dichloroethene	liver		0.0008		0.0008
								Chloroform	ND		0.1		0.1
								cis-1,2-Dichloroethene	NA		—		—
								Trichloroethene	NA		—		—
								Vinyl chloride (Chloroethene)	liver		0.0005		0.0005
			(Total)	NA	NA	NA	NA	(Total)		NA	0.1	NA	0.1

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Table 6-33
Summary of Receptor Risks and Hazards For COPCs
Reasonable Maximum Exposure
Future Resident Child — Subsurface Soil, Sediment and Surface Water — Mill Pond, and Groundwater — Off-Site Floridan Aquifer
Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report
Baseline Human Health Risk Assessment
Former Thompson Industries Site
Madison, Florida

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Child

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
						Total Risk Across Subsurface Soil	NA					Total Hazard Index Across Subsurface Soil	2
						Total Risk Across Sediment — Mill Pond	NA					Total Hazard Index Across Sediment — Mill Pond	0.07
						Total Risk Across Surface Water — Mill Pond	NA					Total Hazard Index Across Surface Water — Mill Pond	13
						Total Risk Across Groundwater — Off-Site Floridan Aquifer	NA					Total Hazard Index Across Groundwater — Off-Site Floridan Aquifer	48
						Total Risk Across All Media and All Exposure Routes	NA					Total Hazard Index Across All Media and All Exposure Routes	63

NA - Not Applicable
ND - No Data
CNS - Central Nervous System

Target Organ HI per Medium

Organs	Soil	Sediment	Surface Water	Groundwater	
blood	0.1	NA	0.0009	1	Total blood HI 1
body weight	0.03	NA	NA	NA	Total body weight HI 0.03
CNS	0.1	NA	NA	NA	Total CNS HI 0.1
eye	0.1	NA	NA	NA	Total eye HI 0.1
gastrointestinal	0.02	NA	NA	NA	Total gastrointestinal HI 0.02
kidney	0.01	NA	0.5	46	Total kidney HI 47
liver	0.3	NA	13	47	Total liver HI 60
lungs	0.002	NA	NA	NA	Total lungs HI 0.002
nose	0.2	NA	NA	NA	Total nose HI 0.2
skin	0.06	NA	NA	NA	Total skin HI 0.06
thyroid	NA	NA	NA	NA	Total thyroid HI NA
none/ND	0.6	0.07	NA	0.5	Total none/ND HI 1

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Table 6-34
Overall Summary of Risks and Hazards for COPCs
Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report
Baseline Human Health Risk Assessment
Former Thompson Industries Site
Madison, Florida

Receptor Exposure Medium	Carcinogenic Risk [1]	Noncarcinogenic Hazard Index [1]
Current Adolescent Trespasser		
Surface Soil — Exposed Surface Soil	1.8E-07	0.1
Current Adolescent Resident		
Surface Water — Unnamed Natural Pond	2.9E-07	0.03
Sediment — Unnamed Natural Pond	8.2E-07	0.5
Current Adult Resident		
Surface Soil — Exposed Surface Soil	6.8E-06	1
Surface Water — Mill Pond	6.2E-06	0.009
Surface Water — Fish from Mill Pond	7.9E-04	8
Sediment — Mill Pond	0.0E+00	0.03
Groundwater — Off-Site Floridan Aquifer	2.6E-03	26
Current Child Resident		
Surface Soil — Exposed Surface Soil	NA	4
Surface Water — Mill Pond	NA	0.03
Surface Water — Fish from Mill Pond	NA	13
Sediment — Mill Pond	NA	0.07
Groundwater — Off-Site Floridan Aquifer	NA	48
Future Industrial Worker		
Surface Soil — Exposed Surface Soil	1.1E-06	0.3
Surface Soil	1.8E-06	0.5
Subsurface Soil — Exposed Subsurface Soil	7.6E-07	0.3
Subsurface Soil	1.9E-06	0.2
Groundwater — On-Site Surficial Aquifer	5.6E-03	30
Future Adolescent Resident		
Surface Water — Unnamed Natural Pond	2.9E-07	0.03
Sediment — Unnamed Natural Pond	8.2E-07	0.5
Future Adult Resident		
Surface Soil — Exposed Surface Soil	6.8E-06	1
Surface Soil	9.4E-06	1
Subsurface Soil — Exposed Surface Soil	4.2E-06	0.8
Subsurface Soil	8.2E-06	0.6
Surface Water — Mill Pond	6.2E-06	0.009
Surface Water — Fish from Mill Pond	7.9E-04	8
Sediment — Mill Pond	0.0E+00	0.03
Groundwater — On-Site Surficial Aquifer	2.9E-02	109
Groundwater — Off-Site Surficial Aquifer	1.3E-02	69
Groundwater — Off-Site Floridan Aquifer	2.6E-03	26

Table 6-34
Overall Summary of Risks and Hazards for COPCs
Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report
Baseline Human Health Risk Assessment
Former Thompson Industries Site
Madison, Florida

Receptor Exposure Medium	Carcinogenic Risk [1]	Noncarcinogenic Hazard Index [1]
Future Child Resident		
Surface Soil — Exposed Surface Soil	NA	4
Surface Soil	NA	4
Subsurface Soil — Exposed Surface Soil	NA	2
Subsurface Soil	NA	2
Surface Water — Mill Pond	NA	0.03
Surface Water — Fish from Mill Pond	NA	13
Sediment — Mill Pond	NA	0.07
Groundwater — On-Site Surficial Aquifer	NA	201
Groundwater — Off-Site Surficial Aquifer	NA	126
Groundwater — Off-Site Floridan Aquifer	NA	48

NA = Not Applicable
NC = No carcinogenic COPCs identified for that medium and intake routes.
[1] Risk values and hazard indices are taken from Tables 6-1 through 6-33. Risk and Hazard calculation tables are located in Appendix D.

Table 6-35
Risk Assessment Summary
Reasonable Maximum Exposure
Current Resident Adult — Surface Soil (Exposed Soil Only), Sediment and Surface Water — Mill Pond, and Groundwater — Off-Site Floridan Aquifer
Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report
Baseline Human Health Risk Assessment
Former Thompson Industries Site
Madison, Florida

Scenario Timeframe:	Current
Receptor Population:	Resident
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	Exposed Surface Soil	*Inorganics*										
			Arsenic	6.11E-06		1.31E-07	6.24E-06						
			(Total)	6.11E-06	NA	1.31E-07	6.24E-06	(Total)		NA	NA	NA	NA
	Air	Particulates from Exposed Surface Soil	*Inorganics*										
			Arsenic		3.80E-09		3.80E-09						
			(Total)	NA	3.80E-09	NA	3.80E-09	(Total)		NA	NA	NA	NA
	Air	Vapors from Exposed Surface Soil	(Total)	NA	NA	NA	NA	(Total)		NA	NA	NA	NA
Sediment	Sediment	Sediment Mill Pond	(Total)	NA	NA	NA	NA	(Total)		NA	NA	NA	NA
Surface Water	Surface Water	Surface Water Mill Pond	*VOCs*					*SVOCs*					
			Vinyl chloride (Chloroethene)	3.19E-06		2.43E-06	5.62E-06	bis(2-Ethylhexyl)phthalate	liver	0.0007		0.002	0.003
			SVOCs					*Inorganics*					
			bis(2-Ethylhexyl)phthalate	8.67E-08		2.99E-07	3.86E-07	Iron	liver	0.002		0.0003	0.002
			Pesticides					*Pesticides*					
			beta-BHC	5.55E-08		1.09E-07	1.64E-07	beta-BHC	liver/kidney	0.0002		0.0005	0.0007
			(Total)	3.33E-06	NA	2.84E-06	6.17E-06	(Total)		0.003	NA	0.003	0.006
	Animal Tissue	Fish from Mill Pond	*VOCs*					*SVOCs*					
			Vinyl chloride (Chloroethene)	1.18E-05			1.18E-05	bis(2-Ethylhexyl)phthalate	liver	6			6
			SVOCs					*Inorganics*					
			bis(2-Ethylhexyl)phthalate	7.16E-04			7.16E-04	Iron	liver	2			2
			Pesticides					*Pesticides*					
			beta-BHC	6.64E-05			6.64E-05	beta-BHC	liver/kidney	0.3			0.3
			(Total)	7.94E-04	NA	NA	7.94E-04	(Total)		8	NA	NA	8

Table 6-35
Risk Assessment Summary
Reasonable Maximum Exposure
Current Resident Adult — Surface Soil (Exposed Soil Only), Sediment and Surface Water — Mill Pond, and Groundwater — Off-Site Floridan Aquifer
Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report
Baseline Human Health Risk Assessment
Former Thompson Industries Site
Madison, Florida

Scenario Timeframe:	Current
Receptor Population:	Resident
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Groundwater	Groundwater Off-Site Floridan Aquifer	*VOCs*					*VOCs*					
			Trichloroethene	1.30E-03		—	1.30E-03	Trichloroethene	liver/kidney	25		—	25
			Vinyl chloride (Chloroethene)	5.00E-06		—	5.00E-06						
			SVOCs										
			bis(2-Ethylhexyl)phthalate	2.48E-06		1.47E-07	2.63E-06						
			(Total)	1.30E-03	NA	1.47E-07	1.30E-03	(Total)		25	NA	0	25
	Air	Groundwater Water Vapors at Showerhead Off-Site Floridan Aquifer	*VOCs*					*VOCs*					
			Trichloroethene		1.30E-03		1.30E-03	Trichloroethene	NA		—		—
			Vinyl chloride (Chloroethene)		1.10E-07		1.10E-07						
			(Total)	NA	1.30E-03	NA	1.30E-03	(Total)		NA	0	NA	0

Total Risk Across Exposed Surface Soil	6.24E-06
Total Risk Across Sediment — Mill Pond	NA
Total Risk Across Surface Water — Mill Pond	8.00E-04
Total Risk Across Groundwater — Off-Site Floridan Aquifer	2.60E-03
Total Risk Across All Media and All Exposure Routes	3.41E-03

Total Hazard Index Across Exposed Surface Soil	NA
Total Hazard Index Across Sediment — Mill Pond	NA
Total Hazard Index Across Surface Water — Mill Pond	8
Total Hazard Index Across Groundwater — Off-Site Floridan Aquifer	25
Total Hazard Index Across All Media and All Exposure Routes	34

NA - Not Applicable

Target Organ HI per Medium

Organ	Soil	Sediment	Surface Water	Groundwater
kidney	NA	NA	0.3	25
liver	NA	NA	8	25

Total kidney HI	26
Total liver HI	34

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Table 6-36
Risk Assessment Summary
Reasonable Maximum Exposure
Current Resident Child — Surface Soil (Exposed Soil Only), Sediment and Surface Water — Mill Pond, and Groundwater — Off-Site Floridan Aquifer
Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report
Baseline Human Health Risk Assessment
Former Thompson Industries Site
Madison, Florida

Scenario Timeframe:	Current
Receptor Population:	Resident
Receptor Age:	Child

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	Exposed Surface Soil						*Inorganics*					
								Aluminum	CNS	2		0.02	2
								Iron	liver	0.4		0.004	0.4
			(Total)	NA	NA	NA	NA	(Total)		2	NA	0.02	2
	Air	Particulates from Exposed Surface Soil						*Inorganics*					
								Iron	NA		—		—
			(Total)	NA	NA	NA	NA	(Total)		NA	0	NA	0
	Air	Vapors from Exposed Surface Soil	(Total)	NA	NA	NA	NA	(Total)		NA	NA	NA	NA
Sediment	Sediment	Sediment Mill Pond	(Total)	NA	NA	NA	NA	(Total)		NA	NA	NA	NA
Surface Water	Surface Water	Surface Water Mill Pond						*SVOCs*					
								bis(2-Ethylhexyl)phthalate	liver	0.003		0.004	0.007
								Inorganics					
								Iron	liver	0.007		0.0004	0.008
								Pesticides					
								beta-BHC	liver/kidney	0.001		0.0007	0.002
			(Total)	NA	NA	NA	NA	(Total)		0.01	NA	0.005	0.02
	Animal Tissue	Fish Tissue from Mill Pond						*SVOCs*					
								bis(2-Ethylhexyl)phthalate	liver	9			9
								Inorganics					
								Iron	liver	3			3
								Pesticides					
								beta-BHC	liver/kidney	0.5			0.5
			(Total)	NA	NA	NA	NA	(Total)		13	NA	NA	13

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Table 6-36
Risk Assessment Summary
Reasonable Maximum Exposure
Current Resident Child — Surface Soil (Exposed Soil Only), Sediment and Surface Water — Mill Pond, and Groundwater — Off-Site Floridan Aquifer
Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report
Baseline Human Health Risk Assessment
Former Thompson Industries Site
Madison, Florida

Scenario Timeframe:	Current
Receptor Population:	Resident
Receptor Age:	Child

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Groundwater	Groundwater Off-Site Floridan Aquifer						VOCs					
			(Total)	NA	NA	NA	NA	Trichloroethene	liver/kidney	46		—	46
								(Total)		46	NA	0	46
	Air	Groundwater Water Vapors at Showerhead Off-Site Floridan Aquifer						VOCs					
			(Total)	NA	NA	NA	NA	Trichloroethene	NA		—		—
								(Total)		NA	0	NA	0
							Total Risk Across Exposed Surface Soil	NA				Total Hazard Index Across Exposed Surface Soil	2
							Total Risk Across Sediment — Mill Pond	NA				Total Hazard Index Across Sediment — Mill Pond	NA
							Total Risk Across Surface Water — Mill Pond	NA				Total Hazard Index Across Surface Water — Mill Pond	13
							Total Risk Across Groundwater — Off-Site Floridan Aquifer	NA				Total Hazard Index Across Groundwater — Off-Site Floridan Aquifer	46
							Total Risk Across All Media and All Exposure Routes	NA				Total Hazard Index Across All Media and All Exposure Routes	62

NA - Not Applicable
CNS - Central Nervous System

Target Organ HI per Medium

Organ	Soil	Sediment	Surface Water	Groundwater		
CNS	2	NA	NA	NA	Total CNS HI	2
kidney	NA	NA	0.5	46	Total kidney HI	47
liver	0.4	NA	13	46	Total liver HI	60

Table 6-37
Risk Assessment Summary
Reasonable Maximum Exposure
Future Industrial Worker — Surface Soil (Exposed Soil Only) and Groundwater — On-Site Surficial Aquifer
Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report
Baseline Human Health Risk Assessment
Former Thompson Industries Site
Madison, Florida

Scenario Timeframe:	Future
Receptor Population:	Industrial Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	Exposed Surface Soil	(Total)	NA	NA	NA	NA	(Total)		NA	NA	NA	NA
	Air	Particulates from Exposed Surface Soil	(Total)	NA	NA	NA	NA	(Total)		NA	NA	NA	NA
	Air	Vapors from Exposed Surface Soil	(Total)	NA	NA	NA	NA	(Total)		NA	NA	NA	NA
Groundwater	Groundwater	Groundwater On-Site Surficial Aquifer	*VOCs*					*VOCs*					
			Trichloroethene	1.09E-03		1.17E-06	1.09E-03	Trichloroethene	liver/kidney	25		0.03	25
			Vinyl chloride (Chloroethene)	4.51E-03		2.21E-06	4.51E-03	Vinyl chloride (Chloroethene)	liver	3		0.001	3
								Inorganics					
								Iron	liver	0.6		0.00006	0.6
			(Total)	5.60E-03	NA	3.38E-06	5.60E-03	(Total)		29	NA	0.03	29

Total Risk Across Exposed Surface Soil	NA
Total Risk Across Groundwater — On-Site Surficial Aquifer	5.60E-03
Total Risk Across All Media and All Exposure Routes	5.60E-03

Total Hazard Index Across Exposed Surface Soil	NA
Total Hazard Index Across Groundwater — On-Site Surficial Aquifer	29
Total Hazard Index Across All Media and All Exposure Routes	29

NA - Not Applicable

Target Organ HI per Medium

Organ	Soil	Sediment	Surface Water	Groundwater		
kidney	NA	NA	NA	25	Total kidney HI	25
liver	NA	NA	NA	29	Total liver HI	29

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Table 6-38
Risk Assessment Summary
Reasonable Maximum Exposure
Future Industrial Worker — Surface Soil and Groundwater — On-Site Surficial Aquifer
Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report
Baseline Human Health Risk Assessment
Former Thompson Industries Site
Madison, Florida

Scenario Timeframe:	Future
Receptor Population:	Industrial Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	Surface Soil	(Total)	NA	NA	NA	NA	(Total)		NA	NA	NA	NA
	Air	Particulates from Surface Soil	(Total)	NA	NA	NA	NA	(Total)		NA	NA	NA	NA
	Air	Vapors from Surface Soil	(Total)	NA	NA	NA	NA	(Total)		NA	NA	NA	NA
Groundwater	Groundwater	Groundwater On-Site Surficial Aquifer	*VOCs*					*VOCs*					
			Trichloroethene	1.09E-03		1.17E-06	1.09E-03	Trichloroethene	liver/kidney	25		0.03	25
			Vinyl chloride (Chloroethene)	4.51E-03		2.21E-06	4.51E-03	Vinyl chloride (Chloroethene)	liver	3		0.001	3
								Inorganics					
			(Total)	5.60E-03	NA	3.38E-06	5.60E-03	Iron	liver	0.6		0.00006	0.6
								(Total)		29	NA	0.03	29

Total Risk Across Surface Soil	NA
Total Risk Across Groundwater — On-Site Surficial Aquifer	5.60E-03
Total Risk Across All Media and All Exposure Routes	5.60E-03

Total Hazard Index Across Surface Soil	NA
Total Hazard Index Across Groundwater — On-Site Surficial Aquifer	29
Total Hazard Index Across All Media and All Exposure Routes	29

NA - Not Applicable

Target Organ HI per Medium

Organ	Soil	Sediment	Surface Water	Groundwater	
kidney	NA	NA	NA	25	Total kidney HI: 25
liver	NA	NA	NA	29	Total liver HI: 29

5 9 0247

Table 6-39
Risk Assessment Summary
Reasonable Maximum Exposure
Future Industrial Worker — Subsurface Soil (Exposed Soil Only) and Groundwater — On-Site Surficial Aquifer
Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report
Baseline Human Health Risk Assessment
Former Thompson Industries Site
Madison, Florida

Scenario Timeframe:	Future
Receptor Population:	Industrial Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Subsurface Soil	Subsurface Soil	Exposed Subsurface Soil	(Total)	NA	NA	NA	NA	(Total)		NA	NA	NA	NA
	Air	Particulates from Exposed Subsurface Soil	(Total)	NA	NA	NA	NA	(Total)		NA	NA	NA	NA
	Air	Vapors from Exposed Subsurface Soil	(Total)	NA	NA	NA	NA	(Total)		NA	NA	NA	NA
Groundwater	Groundwater	Groundwater On-Site Surficial Aquifer	*VOCs*					*VOCs*					
			Trichloroethene	1.09E-03		1.17E-06	1.09E-03	Trichloroethene	liver/kidney	25		0.03	25
			Vinyl chloride (Chloroethene)	4.51E-03		2.21E-06	4.51E-03	Vinyl chloride (Chloroethene)	liver	3		0.001	3
								Inorganics					
			(Total)	5.60E-03	NA	3.38E-06	5.60E-03	Iron (Total)	liver	0.6 29	NA	0.00006 0.03	0.6 29
						Total Risk Across Exposed Subsurface Soil	NA					Total Hazard Index Across Exposed Subsurface Soil	NA
						Total Risk Across Groundwater — On-Site Surficial Aquifer	5.60E-03					Total Hazard Index Across Groundwater — On-Site Surficial Aquifer	29
						Total Risk Across All Media and All Exposure Routes	5.60E-03					Total Hazard Index Across All Media and All Exposure Routes	29

NA - Not Applicable

Target Organ HI per Medium

Organ	Soil	Sediment	Surface Water	Groundwater	
kidney	NA	NA	NA	25	Total kidney HI: 25
liver	NA	NA	NA	29	Total liver HI: 29

5 9 0248

Table 6-40
Risk Assessment Summary
Reasonable Maximum Exposure
Future Industrial Worker — Subsurface Soil and Groundwater — On-Site Surficial Aquifer
Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report
Baseline Human Health Risk Assessment
Former Thompson Industries Site
Madison, Florida

Scenario Timeframe:	Future
Receptor Population:	Industrial Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Subsurface Soil	Subsurface Soil	Subsurface Soil	(Total)	NA	NA	NA	NA	(Total)		NA	NA	NA	NA
	Air	Particulates from Subsurface Soil	(Total)	NA	NA	NA	NA	(Total)		NA	NA	NA	NA
	Air	Vapors from Subsurface Soil	(Total)	NA	NA	NA	NA	(Total)		NA	NA	NA	NA
Groundwater	Groundwater	Groundwater On-Site Surficial Aquifer	*VOCs*					*VOCs*					
			Trichloroethene	1.09E-03		1.17E-06	1.09E-03	Trichloroethene	liver/kidney	25		0.03	25
			Vinyl chloride (Chloroethene)	4.51E-03		2.21E-06	4.51E-03	Vinyl chloride (Chloroethene)	liver	3		0.001	3
								Inorganics					
			(Total)	5.60E-03	NA	3.38E-06	5.60E-03	Iron	liver	0.6		0.00006	0.6
								(Total)		29	NA	0.03	29

Total Risk Across Subsurface Soil	NA
Total Risk Across Groundwater — On-Site Surficial Aquifer	5.60E-03
Total Risk Across All Media and All Exposure Routes	5.60E-03

Total Hazard Index Across Subsurface Soil	NA
Total Hazard Index Across Groundwater — On-Site Surficial Aquifer	29
Total Hazard Index Across All Media and All Exposure Routes	29

NA - Not Applicable

Target Organ HI per Medium

Organ	Soil	Sediment	Surface Water	Groundwater
kidney	NA	NA	NA	25
liver	NA	NA	NA	29

Total kidney HI	25
Total liver HI	29

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Table 6-41
Risk Assessment Summary
Reasonable Maximum Exposure
Future Resident Adult — Surface Soil (Exposed Soil Only), Sediment and Surface Water — Mill Pond, and Groundwater — On-Site Surficial Aquifer
Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report
Baseline Human Health Risk Assessment
Former Thompson Industries Site
Madison, Florida

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	Exposed Surface Soil	*Inorganics*										
			Arsenic	6.11E-06		1.31E-07	6.24E-06						
			(Total)	6.11E-06	NA	1.31E-07	6.24E-06	(Total)		NA	NA	NA	NA
	Air	Particulates from Exposed Surface Soil	*Inorganics*										
			Arsenic		3.80E-09		3.80E-09						
			(Total)	NA	3.80E-09	NA	3.80E-09	(Total)		NA	NA	NA	NA
	Air	Vapors from Exposed Surface Soil	(Total)	NA	NA	NA	NA	(Total)		NA	NA	NA	NA
Sediment	Sediment	Sediment Mill Pond	(Total)	NA	NA	NA	NA	(Total)		NA	NA	NA	NA
Surface Water	Surface Water	Surface Water Mill Pond	*VOCs*					*SVOCs*					
			Vinyl chloride (Chloroethene)	3.19E-06		2.43E-06	5.62E-06	bis(2-Ethylhexyl)phthalate	liver	0.0007		0.002	0.003
			SVOCs					*Inorganics*					
			bis(2-Ethylhexyl)phthalate	8.67E-08		2.99E-07	3.86E-07	Iron	liver	0.002		0.0003	0.002
			Pesticides					*Pesticides*					
			beta-BHC	5.55E-08		1.09E-07	1.64E-07	beta-BHC	liver/kidney	0.0002		0.0005	0.0007
			(Total)	3.33E-06	NA	2.84E-06	6.17E-06	(Total)		0.003	NA	0.003	0.006
	Animal Tissue	Fish from Mill Pond	*VOCs*					*SVOCs*					
			Vinyl chloride (Chloroethene)	1.18E-05			1.18E-05	bis(2-Ethylhexyl)phthalate	liver	6			6
			SVOCs					*Inorganics*					
			bis(2-Ethylhexyl)phthalate	7.16E-04			7.16E-04	Iron	liver	2			2
			Pesticides					*Pesticides*					
			beta-BHC	6.64E-05			6.64E-05	beta-BHC	liver/kidney	0.3			0.3
			(Total)	7.94E-04	NA	NA	7.94E-04	(Total)		8	NA	NA	8

5 9 0250

Table 6-41
Risk Assessment Summary
Reasonable Maximum Exposure
Future Resident Adult — Surface Soil (Exposed Soil Only), Sediment and Surface Water — Mill Pond, and Groundwater — On-Site Surficial Aquifer
Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report
Baseline Human Health Risk Assessment
Former Thompson Industries Site
Madison, Florida

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Groundwater	Groundwater	*VOCs*					*VOCs*					
		On-Site	1,4-Dichlorobenzene	1.57E-06		—	1.57E-06	cis-1,2-Dichloroethene	blood	3		—	3
		Surficial Aquifer	Benzene	3.80E-06		—	3.80E-06	Trichloroethene	liver/kidney	90		—	90
			Trichloroethene	4.64E-03		—	4.64E-03	Vinyl chloride (Chloroethene)	liver	11		—	11
			Vinyl chloride (Chloroethene)	1.92E-02		—	1.92E-02						
								Inorganics					
			Pesticides					Iron	liver	2		0.006	2
			Heptachlor	1.20E-06		2.39E-08	1.23E-06	Manganese	CNS	2		0.1	2
			(Total)	2.38E-02	NA	2.39E-08	2.38E-02	(Total)		107	NA	0.1	108
	Air	Groundwater	*VOCs*					*VOCs*					
		Water Vapors	1,4-Dichlorobenzene		1.44E-06		1.44E-06	cis-1,2-Dichloroethene	NA		—		—
		at Showerhead	Benzene		1.89E-06		1.89E-06	Trichloroethene	NA		—		—
		On-Site	Trichloroethene		4.64E-03		4.64E-03	Vinyl chloride (Chloroethene)	liver		1		1
		Surficial Aquifer	Vinyl chloride (Chloroethene)		4.22E-04		4.22E-04						
			(Total)	NA	5.07E-03	NA	5.07E-03	(Total)		NA	1	NA	1

Total Risk Across Exposed Surface Soil	6.24E-06	Total Hazard Index Across Exposed Surface Soil	NA
Total Risk Across Sediment — Mill Pond	NA	Total Hazard Index Across Sediment — Mill Pond	NA
Total Risk Across Surface Water — Mill Pond	8.00E-04	Total Hazard Index Across Surface Water — Mill Pond	8
Total Risk Across Groundwater — On-Site Surficial Aquifer	2.89E-02	Total Hazard Index Across Groundwater — On-Site Surficial Aquifer	109
Total Risk Across All Media and All Exposure Routes	2.97E-02	Total Hazard Index Across All Media and All Exposure Routes	117

NA - Not Applicable
CNS - Central Nervous System

Target Organ HI per Medium

Organ	Soil	Sediment	Surface Water	Groundwater	
blood	NA	NA	NA	3	Total blood HI: 3
CNS	NA	NA	NA	2	Total CNS HI: 2
kidney	NA	NA	0.3	90	Total kidney HI: 91
liver	NA	NA	8	104	Total liver HI: 113

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Table 6-42
Risk Assessment Summary
Reasonable Maximum Exposure
Future Resident Adult — Surface Soil, Sediment and Surface Water — Mill Pond, and Groundwater — On-Site Surficial Aquifer
Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report
Baseline Human Health Risk Assessment
Former Thompson Industries Site
Madison, Florida

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	Surface Soil	*SVOCs*										
			Benzo(a)pyrene	1.26E-06		2.69E-07	1.53E-06						
			Inorganics										
			Arsenic	4.44E-06		9.51E-08	4.54E-06						
			Chromium	—		—	—						
			PCBs										
			Aroclor 1260	1.04E-06		2.23E-07	1.27E-06						
			(Total)	6.74E-06	NA	5.88E-07	7.33E-06	(Total)		NA	NA	NA	NA
	Air	Particulates from Surface Soil	*SVOCs*										
			Benzo(a)pyrene		3.30E-11		3.30E-11						
			Inorganics										
			Arsenic		2.77E-09		2.77E-09						
			Chromium		1.01E-06		1.01E-06						
			PCBs										
			Aroclor 1260		6.46E-11		6.46E-11						
			(Total)	NA	1.01E-06	NA	1.01E-06	(Total)		NA	NA	NA	NA
	Air	Vapors from Surface Soil	(Total)	NA	NA	NA	NA	(Total)		NA	NA	NA	NA
Sediment	Sediment	Sediment Mill Pond	(Total)	NA	NA	NA	NA	(Total)		NA	NA	NA	NA

5 9 0252

Table 6-42
Risk Assessment Summary
Reasonable Maximum Exposure
Future Resident Adult — Surface Soil, Sediment and Surface Water — Mill Pond, and Groundwater — On-Site Surficial Aquifer
Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report
Baseline Human Health Risk Assessment
Former Thompson Industries Site
Madison, Florida

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Water	Surface Water	Surface Water Mill Pond	*VOCs*					*SVOCs*					
			Vinyl chloride (Chloroethene)	3.19E-06		2.43E-06	5.62E-06	bis(2-Ethylhexyl)phthalate	liver	0.0007		0.002	0.003
			SVOCs					*Inorganics*					
			bis(2-Ethylhexyl)phthalate	8.67E-08		2.99E-07	3.86E-07	Iron	liver	0.002		0.0003	0.002
			Pesticides					*Pesticides*					
			beta-BHC	5.35E-08		1.09E-07	1.64E-07	beta-BHC	liver/kidney	0.0002		0.0005	0.0007
			(Total)	3.33E-06	NA	2.84E-06	6.17E-06	(Total)		0.003	NA	0.003	0.006
	Animal Tissue	Fish from Mill Pond	*VOCs*					*SVOCs*					
			Vinyl chloride (Chloroethene)	1.18E-05			1.18E-05	bis(2-Ethylhexyl)phthalate	liver	6			6
			SVOCs					*Inorganics*					
			bis(2-Ethylhexyl)phthalate	7.16E-04			7.16E-04	Iron	liver	2			2
			Pesticides					*Pesticides*					
			beta-BHC	6.64E-05			6.64E-05	beta-BHC	liver/kidney	0.3			0.3
			(Total)	7.94E-04	NA	NA	7.94E-04	(Total)		8	NA	NA	8
Groundwater	Groundwater	Groundwater On-Site Surficial Aquifer	*VOCs*					*VOCs*					
			1,4-Dichlorobenzene	1.57E-06		—	1.57E-06	cis-1,2-Dichloroethene	blood	3		—	3
			Benzene	3.80E-06		—	3.80E-06	Trichloroethene	liver/kidney	90		—	90
			Trichloroethene	4.64E-03		—	4.64E-03	Vinyl chloride (Chloroethene)	liver	11		—	11
			Vinyl chloride (Chloroethene)	1.92E-02		—	1.92E-02						
			Pesticides					*Inorganics*					
			Heptachlor	1.20E-06		2.39E-08	1.23E-06	Iron	liver	2		0.006	2
			(Total)	2.38E-02	NA	2.39E-08	2.38E-02	Manganese	CNS	2		0.1	2
								(Total)		107	NA	0.1	108

Table 6-42
Risk Assessment Summary
Reasonable Maximum Exposure
Future Resident Adult — Surface Soil, Sediment and Surface Water — Mill Pond, and Groundwater — On-Site Surficial Aquifer
Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report
Baseline Human Health Risk Assessment
Former Thompson Industries Site
Madison, Florida

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Air	Groundwater	*VOCs*					*VOCs*					
		Water Vapors	1,4-Dichlorobenzene		1.44E-06		1.44E-06	cis-1,2-Dichloroethene	NA		—		—
		at Showerhead	Benzene		1.89E-06		1.89E-06	Trichloroethene	NA		—		—
		On-Site	Trichloroethene		4.64E-03		4.64E-03	Vinyl chloride (Chloroethene)	liver		1		1
		Surficial Aquifer	Vinyl chloride (Chloroethene)		4.22E-04		4.22E-04						
			(Total)	NA	5.07E-03	NA	5.07E-03	(Total)		NA	1	NA	1

Total Risk Across Surface Soil	8.34E-06
Total Risk Across Sediment — Mill Pond	NA
Total Risk Across Surface Water — Mill Pond	8.00E-04
Total Risk Across Groundwater — On-Site Surficial Aquifer	2.89E-02
Total Risk Across All Media and All Exposure Routes	2.97E-02

Total Hazard Index Across Surface Soil	NA
Total Hazard Index Across Sediment — Mill Pond	NA
Total Hazard Index Across Surface Water — Mill Pond	8
Total Hazard Index Across Groundwater — On-Site Surficial Aquifer	109
Total Hazard Index Across All Media and All Exposure Routes	117

NA - Not Applicable
CNS - Central Nervous System

Target Organ HI per Medium

Organ	Soil	Sediment	Surface Water	Groundwater
blood	NA	NA	NA	3
CNS	NA	NA	NA	2
kidney	NA	NA	0.3	90
liver	NA	NA	8	104

Total blood HI	3
Total CNS HI	2
Total kidney HI	91
Total liver HI	113

5 9 0254

Table 6-43
Risk Assessment Summary
Reasonable Maximum Exposure
Future Resident Adult — Subsurface Soil (Exposed Soil Only), Sediment and Surface Water — Mill Pond, and Groundwater — On-Site Surficial Aquifer
Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report
Baseline Human Health Risk Assessment
Former Thompson Industries Site
Madison, Florida

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Subsurface Soil	Subsurface Soil	Exposed Subsurface Soil	*Inorganics*										
			Arsenic	3.56E-06		7.62E-08	3.64E-06						
			(Total)	3.56E-06	NA	7.62E-08	3.64E-06	(Total)		NA	NA	NA	NA
	Air	Particulates from Exposed Subsurface Soil	*Inorganics*										
			Arsenic		2.22E-09		2.22E-09						
			(Total)	NA	2.22E-09	NA	2.22E-09	(Total)		NA	NA	NA	NA
	Air	Vapors from Exposed Subsurface Soil											
			(Total)	NA	NA	NA	NA	(Total)		NA	NA	NA	NA
Sediment	Sediment	Sediment Mill Pond											
			(Total)	NA	NA	NA	NA	(Total)		NA	NA	NA	NA
Surface Water	Surface Water	Surface Water Mill Pond	*VOCs*					*SVOCs*					
			Vinyl chloride (Chloroethene)	3.19E-06		2.43E-06	5.62E-06	bis(2-Ethylhexyl)phthalate	liver	0.0007		0.002	0.003
			SVOCs					*Inorganics*					
			bis(2-Ethylhexyl)phthalate	8.67E-08		2.99E-07	3.86E-07	Iron	liver	0.002		0.0003	0.002
			Pesticides					*Pesticides*					
			beta-BHC	5.55E-08		1.09E-07	1.64E-07	beta-BHC	liver/kidney	0.0002		0.0005	0.0007
			(Total)	3.33E-06	NA	2.84E-06	6.17E-06	(Total)		0.003	NA	0.003	0.006
	Animal Tissue	Fish from Mill Pond	*VOCs*					*SVOCs*					
			Vinyl chloride (Chloroethene)	1.18E-05			1.18E-05	bis(2-Ethylhexyl)phthalate	liver	6			6
			SVOCs					*Inorganics*					
			bis(2-Ethylhexyl)phthalate	7.16E-04			7.16E-04	Iron	liver	2			2
			Pesticides					*Pesticides*					
			beta-BHC	6.64E-05			6.64E-05	beta-BHC	liver/kidney	0.3			0.3
			(Total)	7.94E-04	NA	NA	7.94E-04	(Total)		8	NA	NA	8

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Table 6-43
Risk Assessment Summary
Reasonable Maximum Exposure
Future Resident Adult — Subsurface Soil (Exposed Soil Only), Sediment and Surface Water — Mill Pond, and Groundwater — On-Site Surficial Aquifer
Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report
Baseline Human Health Risk Assessment
Former Thompson Industries Site
Madison, Florida

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Groundwater	Groundwater On-Site Surficial Aquifer	*VOCs*					*VOCs*					
			1,4-Dichlorobenzene	1.57E-06		—	1.57E-06	cis-1,2-Dichloroethene	blood	3		—	3
			Benzene	3.80E-06		—	3.80E-06	Trichloroethene	liver/kidney	90		—	90
			Trichloroethene	4.64E-03		—	4.64E-03	Vinyl chloride (Chloroethene)	liver	11		—	11
			Vinyl chloride (Chloroethene)	1.92E-02		—	1.92E-02						
								Inorganics					
			Pesticides					Iron	liver	2		0.006	2
			Heptachlor	1.20E-06		2.39E-08	1.23E-06	Manganese	CNS	2		0.1	2
			(Total)	2.38E-02	NA	2.39E-08	2.38E-02	(Total)		107	NA	0.1	108
	Air	Groundwater Water Vapors at Showerhead On-Site Surficial Aquifer	*VOCs*					*VOCs*					
			1,4-Dichlorobenzene		1.44E-06		1.44E-06	cis-1,2-Dichloroethene	NA		—		—
			Benzene		1.89E-06		1.89E-06	Trichloroethene	NA		—		—
			Trichloroethene		4.64E-03		4.64E-03	Vinyl chloride (Chloroethene)	liver		1		1
			Vinyl chloride (Chloroethene)		4.22E-04		4.22E-04						
			(Total)	NA	5.07E-03	NA	5.07E-03	(Total)		NA	1	NA	1
						Total Risk Across Exposed Subsurface Soil	3.64E-06					Total Hazard Index Across Exposed Subsurface Soil	NA
						Total Risk Across Sediment — Mill Pond	NA					Total Hazard Index Across Sediment — Mill Pond	NA
						Total Risk Across Surface Water — Mill Pond	8.00E-04					Total Hazard Index Across Surface Water — Mill Pond	8
						Total Risk Across Groundwater — On-Site Surficial Aquifer	2.89E-02					Total Hazard Index Across Groundwater — On-Site Surficial Aquifer	109
						Total Risk Across All Media and All Exposure Routes	2.97E-02					Total Hazard Index Across All Media and All Exposure Routes	117

NA - Not Applicable
CNS - Central Nervous System

Target Organ HI per Medium

Organ	Soil	Sediment	Surface Water	Groundwater
blood	NA	NA	NA	3
CNS	NA	NA	NA	2
kidney	NA	NA	0.3	90
liver	NA	NA	8	104

Total blood HI	3
Total CNS HI	2
Total kidney HI	91
Total liver HI	113

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Table 6-44
Risk Assessment Summary
Reasonable Maximum Exposure
Future Resident Adult — Subsurface Soil, Sediment and Surface Water — Mill Pond, and Groundwater — On-Site Surficial Aquifer
Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report
Baseline Human Health Risk Assessment
Former Thompson Industries Site
Madison, Florida

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Subsurface Soil	Subsurface Soil	Subsurface Soil	*VOCs*										
			Vinyl chloride (Chloroethene)	6.20E-07		1.33E-07	7.52E-07						
			SVOCs										
			Benzo(a)pyrene	1.26E-06		2.69E-07	1.53E-06						
			Inorganics										
			Arsenic	3.22E-06		6.90E-08	3.29E-06						
			(Total)	5.10E-06	NA	4.71E-07	5.57E-06	(Total)		NA	NA	NA	NA
	Air	Particulates from Subsurface Soil	*SVOCs*										
			Benzo(a)pyrene		3.30E-11		3.30E-11						
			Inorganics										
			Arsenic		2.01E-09		2.01E-09						
			(Total)	NA	2.04E-09	NA	2.04E-09	(Total)		NA	NA	NA	NA
	Air	Vapors from Subsurface Soil	*VOCs*										
			Vinyl chloride (Chloroethene)		1.18E-06		1.18E-06						
			(Total)	NA	1.18E-06	NA	1.18E-06	(Total)		NA	NA	NA	NA
Sediment	Sediment	Sediment Mill Pond											
			(Total)	NA	NA	NA	NA	(Total)		NA	NA	NA	NA
Surface Water	Surface Water	Surface Water Mill Pond	*VOCs*					*SVOCs*					
			Vinyl chloride (Chloroethene)	3.19E-06		2.43E-06	5.62E-06	bis(2-Ethylhexyl)phthalate	liver	0.0007		0.002	0.003
			SVOCs					*Inorganics*					
			bis(2-Ethylhexyl)phthalate	8.67E-08		2.99E-07	3.86E-07	Iron	liver	0.002		0.0003	0.002
			Pesticides					*Pesticides*					
			beta-BHC	5.55E-08		1.09E-07	1.64E-07	beta-BHC	liver/kidney	0.0002		0.0005	0.0007
			(Total)	3.33E-06	NA	2.84E-06	6.17E-06	(Total)		0.003	NA	0.003	0.006
	Animal Tissue	Fish from Mill Pond	*VOCs*					*SVOCs*					
			Vinyl chloride (Chloroethene)	1.18E-05			1.18E-05	bis(2-Ethylhexyl)phthalate	liver	6			6
			SVOCs					*Inorganics*					
			bis(2-Ethylhexyl)phthalate	7.16E-04			7.16E-04	Iron	liver	2			2
			Pesticides					*Pesticides*					
			beta-BHC	6.64E-05			6.64E-05	beta-BHC	liver/kidney	0.3			0.3
			(Total)	7.94E-04	NA	NA	7.94E-04	(Total)		8	NA	NA	8

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Table 6-44
Risk Assessment Summary
Reasonable Maximum Exposure
Future Resident Adult — Subsurface Soil, Sediment and Surface Water — Mill Pond, and Groundwater — On-Site Surficial Aquifer
Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report
***Baseline* Human Health Risk Assessment**
Former Thompson Industries Site
Madison, Florida

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Groundwater	Groundwater - On-Site Surficial Aquifer	*VOCs*					*VOCs*					
			1,4-Dichlorobenzene	1.57E-06		—	1.57E-06	cis-1,2-Dichloroethene	blood	3		—	3
			Benzene	3.80E-06		—	3.80E-06	Trichloroethene	liver/kidney	90		—	90
			Trichloroethene	4.64E-03		—	4.64E-03	Vinyl chloride (Chloroethene)	liver	11		—	11
			Vinyl chloride (Chloroethene)	1.92E-02		—	1.92E-02						
			Pesticides					*Inorganics*					
			Heptachlor	1.20E-06		2.39E-08	1.23E-06	Iron	liver	2		0.006	2
								Manganese	CNS	2		0.1	2
			(Total)	2.38E-02	NA	2.39E-08	2.38E-02	(Total)		107	NA	0.1	108
	Air	Groundwater Water Vapors at Showerhead On-Site Surficial Aquifer	*VOCs*					*VOCs*					
			1,4-Dichlorobenzene		1.44E-06		1.44E-06	cis-1,2-Dichloroethene	NA		—		—
			Benzene		1.89E-06		1.89E-06	Trichloroethene	NA		—		—
			Trichloroethene		4.64E-03		4.64E-03	Vinyl chloride (Chloroethene)	liver		1		1
			Vinyl chloride (Chloroethene)		4.22E-04		4.22E-04						
			(Total)	NA	5.07E-03	NA	5.07E-03	(Total)		NA	1	NA	1

Total Risk Across Subsurface Soil	6.75E-06
Total Risk Across Sediment — Mill Pond	NA
Total Risk Across Surface Water — Mill Pond	8.00E-04
Total Risk Across Groundwater — On-Site Surficial Aquifer	2.59E-02
Total Risk Across All Media and All Exposure Routes	2.97E-02

Total Hazard Index Across Subsurface Soil	NA
Total Hazard Index Across Sediment — Mill Pond	NA
Total Hazard Index Across Surface Water — Mill Pond	8
Total Hazard Index Across Groundwater — On-Site Surficial Aquifer	109
Total Hazard Index Across All Media and All Exposure Routes	117

NA - Not Applicable
CNS - Central Nervous System

Target Organ HI per Medium

Organ	Soil	Sediment	Surface Water	Groundwater
blood	NA	NA	NA	3
CNS	NA	NA	NA	2
kidney	NA	NA	0.3	90
liver	NA	NA	8	104

Total blood HI	3
Total CNS HI	2
Total kidney HI	91
Total liver HI	113

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Table 6-45
Risk Assessment Summary
Reasonable Maximum Exposure
Future Resident Adult — Surface Soil (Exposed Soil Only), Sediment and Surface Water — Mill Pond, and Groundwater — Off-Site Surficial Aquifer
Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report
Baseline Human Health Risk Assessment
Former Thompson Industries Site
Madison, Florida

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	Exposed Surface Soil	*Inorganics*										
			Arsenic	6.11E-06		1.31E-07	6.24E-06						
			(Total)	6.11E-06	NA	1.31E-07	6.24E-06	(Total)		NA	NA	NA	NA
	Air	Particulates from Exposed Surface Soil	*Inorganics*										
			Arsenic		3.80E-09		3.80E-09						
			(Total)	NA	3.80E-09	NA	3.80E-09	(Total)		NA	NA	NA	NA
	Air	Vapors from Exposed Surface Soil	(Total)	NA	NA	NA	NA	(Total)		NA	NA	NA	NA
Sediment	Sediment	Sediment Mill Pond	(Total)	NA	NA	NA	NA	(Total)		NA	NA	NA	NA
Surface Water	Surface Water	Surface Water Mill Pond	*VOCs*					*SVOCs*					
			Vinyl chloride (Chloroethene)	3.19E-06		2.43E-06	5.62E-06	bis(2-Ethylhexyl)phthalate	liver	0.0007		0.002	0.003
			SVOCs					*Inorganics*					
			bis(2-Ethylhexyl)phthalate	8.67E-08		2.99E-07	3.86E-07	Iron	liver	0.002		0.0003	0.002
			Pesticides					*Pesticides*					
			beta-BHC	5.55E-08		1.09E-07	1.64E-07	beta-BHC	liver/kidney	0.0002		0.0005	0.0007
			(Total)	3.33E-06	NA	2.84E-06	6.17E-06	(Total)		0.003	NA	0.003	0.006
	Animal Tissue	Fish from Mill Pond	*VOCs*					*SVOCs*					
			Vinyl chloride (Chloroethene)	1.18E-05			1.18E-05	bis(2-Ethylhexyl)phthalate	liver	6			6
			SVOCs					*Inorganics*					
			bis(2-Ethylhexyl)phthalate	7.16E-04			7.16E-04	Iron	liver	2			2
			Pesticides					*Pesticides*					
			beta-BHC	6.64E-05			6.64E-05	beta-BHC	liver/kidney	0.3			0.3
			(Total)	7.94E-04	NA	NA	7.94E-04	(Total)		8	NA	NA	8

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Table 6-45
Risk Assessment Summary
Reasonable Maximum Exposure
Future Resident Adult — Surface Soil (Exposed Soil Only), Sediment and Surface Water — Mill Pond, and Groundwater — Off-Site Surficial Aquifer
Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report
Baseline Human Health Risk Assessment
Former Thompson Industries Site
Madison, Florida

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Groundwater	Groundwater	*VOCs*					*VOCs*					
		Off-Site	Benzene	7.09E-07		—	7.09E-07	cis-1,2-Dichloroethene	blood	2		—	2
		Surficial Aquifer	Trichloroethene	3.16E-03		—	3.16E-03	Trichloroethene	liver/kidney	61		—	61
			Vinyl chloride (Chloroethene)	6.41E-03		—	6.41E-03	Vinyl chloride (Chloroethene)	liver	4		—	4
			SVOCs					*Inorganics*					
			bis(2-Ethylhexyl)phthalate	3.54E-06		2.10E-07	3.75E-06	Iron	liver	0.5		0.001	0.5
			Pesticides										
			Dieldrin	1.37E-05		3.95E-07	1.41E-05						
			(Total)	9.59E-03	NA	6.05E-07	9.59E-03	(Total)		67	NA	0.001	67
	Air	Groundwater	*VOCs*					*VOCs*					
		Water Vapors	Benzene		3.52E-07		3.52E-07	cis-1,2-Dichloroethene	NA		—		—
		at Showerhead	Trichloroethene		3.16E-03		3.16E-03	Trichloroethene	NA		—		—
		Off-Site	Vinyl chloride (Chloroethene)		1.41E-04		1.41E-04	Vinyl chloride (Chloroethene)	liver		0.4		0.4
		Surficial Aquifer	(Total)	NA	3.30E-03	NA	3.30E-03	(Total)		NA	0.4	NA	0.4

Total Risk Across Exposed Surface Soil	6.24E-06
Total Risk Across Sediment — Mill Pond	NA
Total Risk Across Surface Water — Mill Pond	8.00E-04
Total Risk Across Groundwater — Off-Site Surficial Aquifer	1.29E-02
Total Risk Across All Media and All Exposure Routes	1.37E-02

Total Hazard Index Across Exposed Surface Soil	NA
Total Hazard Index Across Sediment — Mill Pond	NA
Total Hazard Index Across Surface Water — Mill Pond	8
Total Hazard Index Across Groundwater — Off-Site Surficial Aquifer	68
Total Hazard Index Across All Media and All Exposure Routes	76

NA - Not Applicable

Target Organ HI per Medium

Organ	Soil	Sediment	Surface Water	Groundwater
blood	NA	NA	NA	2
kidney	NA	NA	0.3	61
liver	NA	NA	8	66

Total blood HI	2
Total kidney HI	62
Total liver HI	74

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Table 6-46
Risk Assessment Summary
Reasonable Maximum Exposure
Future Resident Adult — Surface Soil, Sediment and Surface Water — Mill Pond, and Groundwater — Off-Site Surficial Aquifer
Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report
Baseline Human Health Risk Assessment
Former Thompson Industries Site
Madison, Florida

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	Surface Soil	*SVOCs*										
			Benzo(a)pyrene	1.26E-06		2.69E-07	1.53E-06						
			Inorganics										
			Arsenic	4.44E-06		9.51E-08	4.54E-06						
			Chromium	—		—	—						
			PCBs										
			Aroclor 1260	1.04E-06		2.23E-07	1.27E-06						
			(Total)	6.74E-06	NA	5.88E-07	7.33E-06	(Total)		NA	NA	NA	NA
	Air	Particulates from Surface Soil	*SVOCs*										
			Benzo(a)pyrene		3.30E-11		3.30E-11						
			Inorganics										
			Arsenic		2.77E-09		2.77E-09						
			Chromium		1.01E-06		1.01E-06						
			PCBs										
			Aroclor 1260		6.46E-11		6.46E-11						
			(Total)	NA	1.01E-06	NA	1.01E-06	(Total)		NA	NA	NA	NA
	Air	Vapors from Surface Soil	(Total)	NA	NA	NA	NA	(Total)		NA	NA	NA	NA
Sediment	Sediment	Sediment Mill Pond	(Total)	NA	NA	NA	NA	(Total)		NA	NA	NA	NA
Surface Water	Surface Water	Surface Water Mill Pond	*VOCs*					*SVOCs*					
			Vinyl chloride (Chloroethene)	3.19E-06		2.43E-06	5.62E-06	bis(2-Ethylhexyl)phthalate	liver	0.0007		0.002	0.003
			SVOCs					*Inorganics*					
			bis(2-Ethylhexyl)phthalate	8.67E-08		2.99E-07	3.86E-07	Iron	liver	0.002		0.0003	0.002
			Pesticides					*Pesticides*					
			beta-BHC	5.55E-08		1.09E-07	1.64E-07	beta-BHC	liver/kidney	0.0002		0.0005	0.0007
			(Total)	3.33E-06	NA	2.84E-06	6.17E-06	(Total)		0.003	NA	0.003	0.006

Table 6-46
Risk Assessment Summary
Reasonable Maximum Exposure
Future Resident Adult — Surface Soil, Sediment and Surface Water — Mill Pond, and Groundwater — Off-Site Surficial Aquifer
Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report
Baseline Human Health Risk Assessment
Former Thompson Industries Site
Madison, Florida

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Water	Animal Tissue	Fish from Mill Pond	*VOCs*					*SVOCs*					
			Vinyl chloride (Chloroethene)	1.18E-05			1.18E-05	bis(2-Ethylhexyl)phthalate	liver	6			6
			SVOCs					*Inorganics*					
			bis(2-Ethylhexyl)phthalate	7.16E-04			7.16E-04	Iron	liver	2			2
			Pesticides					*Pesticides*					
			beta-BHC	6.64E-05			6.64E-05	beta-BHC	liver/kidney	0.3			0.3
			(Total)	7.94E-04	NA	NA	7.94E-04	(Total)		8	NA	NA	8
Groundwater	Groundwater	Groundwater Off-Site Surficial Aquifer	*VOCs*					*VOCs*					
			Benzene	7.09E-07		—	7.09E-07	cis-1,2-Dichloroethene	blood	2		—	2
			Trichloroethene	3.16E-03		—	3.16E-03	Trichloroethene	liver/kidney	61		—	61
			Vinyl chloride (Chloroethene)	6.41E-03		—	6.41E-03	Vinyl chloride (Chloroethene)	liver	4		—	4
			SVOCs					*Inorganics*					
			bis(2-Ethylhexyl)phthalate	3.54E-06		2.10E-07	3.75E-06	Iron	liver	0.5		0.001	0.5
			Pesticides										
			Dieldrin	1.37E-05		3.95E-07	1.41E-05						
			(Total)	9.59E-03	NA	6.05E-07	9.59E-03	(Total)		67	NA	0.001	67
	Air	Groundwater Water Vapors at Showerhead Off-Site Surficial Aquifer	*VOCs*					*VOCs*					
			Benzene		3.52E-07		3.52E-07	cis-1,2-Dichloroethene	NA		—		—
			Trichloroethene		3.16E-03		3.16E-03	Trichloroethene	NA		—		—
			Vinyl chloride (Chloroethene)		1.41E-04		1.41E-04	Vinyl chloride (Chloroethene)	liver		0.4		0.4
			(Total)	NA	3.30E-03	NA	3.30E-03	(Total)		NA	0.4	NA	0.4

Total Risk Across Surface Soil	8.34E-06
Total Risk Across Sediment — Mill Pond	NA
Total Risk Across Surface Water — Mill Pond	8.00E-04
Total Risk Across Groundwater — Off-Site Surficial Aquifer	1.29E-02
Total Risk Across All Media and All Exposure Routes	1.37E-02

Total Hazard Index Across Surface Soil	NA
Total Hazard Index Across Sediment — Mill Pond	NA
Total Hazard Index Across Surface Water — Mill Pond	8
Total Hazard Index Across Groundwater — Off-Site Surficial Aquifer	68
Total Hazard Index Across All Media and All Exposure Routes	76

NA - Not Applicable

Target Organ HI per Medium

Organ	Soil	Sediment	Surface Water	Groundwater
blood	NA	NA	NA	2
kidney	NA	NA	0.3	61
liver	NA	NA	8	66

Total blood HI	2
Total kidney HI	62
Total liver HI	74

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Table 6-47
Risk Assessment Summary
Reasonable Maximum Exposure
Future Resident Adult — Subsurface Soil (Exposed Soil Only), Sediment and Surface Water — Mill Pond, and Groundwater — Off-Site Surficial Aquifer
Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report
Baseline Human Health Risk Assessment
Former Thompson Industries Site
Madison, Florida

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Subsurface Soil	Subsurface Soil	Exposed Subsurface Soil	*Inorganics*										
			Arsenic	3.56E-06		7.62E-08	3.64E-06						
			(Total)	3.56E-06	NA	7.62E-08	3.64E-06	(Total)		NA	NA	NA	NA
	Air	Particulates from Exposed Subsurface Soil	*Inorganics*										
			Arsenic		2.22E-09		2.22E-09						
			(Total)	NA	2.22E-09	NA	2.22E-09	(Total)		NA	NA	NA	NA
	Air	Vapors from Exposed Subsurface Soil											
			(Total)	NA	NA	NA	NA	(Total)		NA	NA	NA	NA
Sediment	Sediment	Sediment Mill Pond											
			(Total)	NA	NA	NA	NA	(Total)		NA	NA	NA	NA
Surface Water	Surface Water	Surface Water Mill Pond	*VOCs*					*SVOCs*					
			Vinyl chloride (Chloroethene)	3.19E-06		2.43E-06	5.62E-06	bis(2-Ethylhexyl)phthalate	liver	0.0007		0.002	0.003
			SVOCs					*Inorganics*					
			bis(2-Ethylhexyl)phthalate	8.67E-08		2.99E-07	3.86E-07	Iron	liver	0.002		0.0003	0.002
			Pesticides					*Pesticides*					
			beta-BHC	5.55E-08		1.09E-07	1.64E-07	beta-BHC	liver/kidney	0.0002		0.0005	0.0007
			(Total)	3.33E-06	NA	2.84E-06	6.17E-06	(Total)		0.003	NA	0.003	0.006
	Animal Tissue	Fish from Mill Pond	*VOCs*					*SVOCs*					
			Vinyl chloride (Chloroethene)	1.18E-05			1.18E-05	bis(2-Ethylhexyl)phthalate	liver	6			6
			SVOCs					*Inorganics*					
			bis(2-Ethylhexyl)phthalate	7.16E-04			7.16E-04	Iron	liver	2			2
			Pesticides					*Pesticides*					
			beta-BHC	6.64E-05			6.64E-05	beta-BHC	liver/kidney	0.3			0.3
			(Total)	7.94E-04	NA	NA	7.94E-04	(Total)		8	NA	NA	8

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Table 6-47
Risk Assessment Summary
Reasonable Maximum Exposure
Future Resident Adult — Subsurface Soil (Exposed Soil Only), Sediment and Surface Water — Mill Pond, and Groundwater — Off-Site Surficial Aquifer
Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report
Baseline Human Health Risk Assessment
Former Thompson Industries Site
Madison, Florida

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Groundwater	Groundwater	*VOCs*					*VOCs*					
		Off-Site	Benzene	7.09E-07		—	7.09E-07	cis-1,2-Dichloroethene	blood	2		—	2
		Surficial Aquifer	Trichloroethene	3.16E-03		—	3.16E-03	Trichloroethene	liver/kidney	61		—	61
			Vinyl chloride (Chloroethene)	6.41E-03		—	6.41E-03	Vinyl chloride (Chloroethene)	liver	4		—	4
			SVOCs					*Inorganics*					
			bis(2-Ethylhexyl)phthalate	3.54E-06		2.10E-07	3.75E-06	Iron	liver	0.5		0.001	0.5
			Pesticides										
			Dieldrin	1.37E-05		3.95E-07	1.41E-05						
			(Total)	9.59E-03	NA	6.05E-07	9.59E-03	(Total)		67	NA	0.001	67
	Air	Groundwater	*VOCs*					*VOCs*					
		Water Vapors	Benzene		3.52E-07		3.52E-07	cis-1,2-Dichloroethene	NA		—		—
		at Showerhead	Trichloroethene		3.16E-03		3.16E-03	Trichloroethene	NA		—		—
		Off-Site	Vinyl chloride (Chloroethene)		1.41E-04		1.41E-04	Vinyl chloride (Chloroethene)	liver		0.4		0.4
		Surficial Aquifer	(Total)	NA	3.30E-03	NA	3.30E-03	(Total)		NA	0.4	NA	0.4

Total Risk Across Exposed Subsurface Soil	3.64E-06
Total Risk Across Sediment — Mill Pond	NA
Total Risk Across Surface Water — Mill Pond	8.00E-04
Total Risk Across Groundwater — Off-Site Surficial Aquifer	1.29E-02
Total Risk Across All Media and All Exposure Routes	1.37E-02

Total Hazard Index Across Exposed Subsurface Soil	NA
Total Hazard Index Across Sediment — Mill Pond	NA
Total Hazard Index Across Surface Water — Mill Pond	8
Total Hazard Index Across Groundwater — Off-Site Surficial Aquifer	68
Total Hazard Index Across All Media and All Exposure Routes	76

NA - Not Applicable

Target Organ HI per Medium

Organ	Soil	Sediment	Surface Water	Groundwater
blood	NA	NA	NA	2
kidney	NA	NA	0.3	61
liver	NA	NA	8	66

Total blood HI	2
Total kidney HI	62
Total liver HI	74

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Table 6-48
Risk Assessment Summary
Reasonable Maximum Exposure
Future Resident Adult — Subsurface Soil, Sediment and Surface Water — Mill Pond, and Groundwater — Off-Site Surficial Aquifer
Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report
Baseline Human Health Risk Assessment
Former Thompson Industries Site
Madison, Florida

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Subsurface Soil	Subsurface Soil	Subsurface Soil	*VOCs*										
			Vinyl chloride (Chloroethene)	6.20E-07		1.33E-07	7.52E-07						
			SVOCs										
			Benzo(a)pyrene	1.26E-06		2.69E-07	1.53E-06						
			Inorganics										
			Arsenic	3.22E-06		6.90E-08	3.29E-06						
			(Total)	5.10E-06	NA	4.71E-07	5.57E-06	(Total)		NA	NA	NA	NA
	Air	Particulates from Subsurface Soil	*SVOCs*										
			Benzo(a)pyrene		3.30E-11		3.30E-11						
			Inorganics										
			Arsenic		2.01E-09		2.01E-09						
			(Total)	NA	2.04E-09	NA	2.04E-09	(Total)		NA	NA	NA	NA
	Air	Vapors from Subsurface Soil	*VOCs*										
			Vinyl chloride (Chloroethene)		1.18E-06		1.18E-06						
			(Total)	NA	1.18E-06	NA	1.18E-06	(Total)		NA	NA	NA	NA
Sediment	Sediment	Sediment Mill Pond											
			(Total)	NA	NA	NA	NA	(Total)		NA	NA	NA	NA
Surface Water	Surface Water	Surface Water Mill Pond	*VOCs*					*SVOCs*					
			Vinyl chloride (Chloroethene)	3.19E-06		2.43E-06	5.62E-06	bis(2-Ethylhexyl)phthalate	liver	0.0007		0.002	0.003
			SVOCs					*Inorganics*					
			bis(2-Ethylhexyl)phthalate	8.67E-08		2.99E-07	3.86E-07	Iron	liver	0.002		0.0003	0.002
			Pesticides					*Pesticides*					
			beta-BHC	5.55E-08		1.09E-07	1.64E-07	beta-BHC	liver/kidney	0.0002		0.0005	0.0007
			(Total)	3.33E-06	NA	2.84E-06	6.17E-06	(Total)		0.003	NA	0.003	0.006

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Table 6-48
Risk Assessment Summary
Reasonable Maximum Exposure
Future Resident Adult — Subsurface Soil, Sediment and Surface Water — Mill Pond, and Groundwater — Off-Site Surficial Aquifer
Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report
Baseline Human Health Risk Assessment
Former Thompson Industries Site
Madison, Florida

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Water	Animal Tissue	Fish from Mill Pond	*VOCs*					*SVOCs*					
			Vinyl chloride (Chloroethene)	1.18E-05			1.18E-05	bis(2-Ethylhexyl)phthalate	liver	6			6
			SVOCs					*Inorganics*					
			bis(2-Ethylhexyl)phthalate	7.16E-04			7.16E-04	Iron	liver	2			2
			Pesticides					*Pesticides*					
			beta-BHC	6.64E-05			6.64E-05	beta-BHC	liver/kidney	0.3			0.3
			(Total)	7.94E-04	NA	NA	7.94E-04	(Total)		8	NA	NA	8
Groundwater	Groundwater	Groundwater Off-Site Surficial Aquifer	*VOCs*					*VOCs*					
			Benzene	7.09E-07		—	7.09E-07	cis-1,2-Dichloroethene	blood	2		—	2
			Trichloroethene	3.16E-03		—	3.16E-03	Trichloroethene	liver/kidney	61		—	61
			Vinyl chloride (Chloroethene)	6.41E-03		—	6.41E-03	Vinyl chloride (Chloroethene)	liver	4		—	4
			SVOCs					*Inorganics*					
			bis(2-Ethylhexyl)phthalate	3.54E-06		2.10E-07	3.75E-06	Iron	liver	0.5		0.001	0.5
			Pesticides										
			Dieldrin	1.37E-05		3.95E-07	1.41E-05						
			(Total)	9.59E-03	NA	6.05E-07	9.59E-03	(Total)		67	NA	0.001	67
	Air	Groundwater Water Vapors at Showerhead Off-Site Surficial Aquifer	*VOCs*					*VOCs*					
			Benzene		3.52E-07		3.52E-07	cis-1,2-Dichloroethene	NA		—		—
			Trichloroethene		3.16E-03		3.16E-03	Trichloroethene	NA		—		—
			Vinyl chloride (Chloroethene)		1.41E-04		1.41E-04	Vinyl chloride (Chloroethene)	liver		0.4		0.4
			(Total)	NA	3.30E-03	NA	3.30E-03	(Total)		NA	0.4	NA	0.4

Total Risk Across Subsurface Soil	6.75E-06
Total Risk Across Sediment — Mill Pond	NA
Total Risk Across Surface Water — Mill Pond	8.00E-04
Total Risk Across Groundwater — Off-Site Surficial Aquifer	1.29E-02
Total Risk Across All Media and All Exposure Routes	1.37E-02

Total Hazard Index Across Subsurface Soil	NA
Total Hazard Index Across Sediment — Mill Pond	NA
Total Hazard Index Across Surface Water — Mill Pond	8
Total Hazard Index Across Groundwater — Off-Site Surficial Aquifer	68
Total Hazard Index Across All Media and All Exposure Routes	76

NA - Not Applicable

Target Organ HI per Medium

Organ	Soil	Sediment	Surface Water	Groundwater
blood	NA	NA	NA	2
kidney	NA	NA	0.3	61
liver	NA	NA	8	66

Total blood HI	2
Total kidney HI	62
Total liver HI	74

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Table 6-49
Risk Assessment Summary
Reasonable Maximum Exposure
Future Resident Adult — Surface Soil (Exposed Soil Only), Sediment and Surface Water — Mill Pond, and Groundwater — Off-Site Floridan Aquifer
Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report
Baseline Human Health Risk Assessment
Former Thompson Industries Site
Madison, Florida

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	Exposed Surface Soil	*Inorganics*										
			Arsenic	6.11E-06		1.31E-07	6.24E-06						
			(Total)	6.11E-06	NA	1.31E-07	6.24E-06	(Total)		NA	NA	NA	NA
	Air	Particulates from Exposed Surface Soil	*Inorganics*										
			Arsenic		3.80E-09		3.80E-09						
			(Total)	NA	3.80E-09	NA	3.80E-09	(Total)		NA	NA	NA	NA
	Air	Vapors from Exposed Surface Soil	(Total)	NA	NA	NA	NA	(Total)		NA	NA	NA	NA
Sediment	Sediment	Sediment Mill Pond	(Total)	NA	NA	NA	NA	(Total)		NA	NA	NA	NA
Surface Water	Surface Water	Surface Water Mill Pond	*VOCs*					*SVOCs*					
			Vinyl chloride (Chloroethene)	3.19E-06		2.43E-06	5.62E-06	bis(2-Ethylhexyl)phthalate	liver	0.0007		0.002	0.003
			SVOCs					*Inorganics*					
			bis(2-Ethylhexyl)phthalate	8.67E-08		2.99E-07	3.86E-07	Iron	liver	0.002		0.0003	0.002
			Pesticides					*Pesticides*					
			beta-BHC	5.55E-08		1.09E-07	1.64E-07	beta-BHC	liver/kidney	0.0002		0.0005	0.0007
			(Total)	3.33E-06	NA	2.84E-06	6.17E-06	(Total)		0.003	NA	0.003	0.006
	Animal Tissue	Fish from Mill Pond	*VOCs*					*SVOCs*					
			Vinyl chloride (Chloroethene)	1.18E-05			1.18E-05	bis(2-Ethylhexyl)phthalate	liver	6			6
			SVOCs					*Inorganics*					
			bis(2-Ethylhexyl)phthalate	7.16E-04			7.16E-04	Iron	liver	2			2
			Pesticides					*Pesticides*					
			beta-BHC	6.64E-05			6.64E-05	beta-BHC	liver/kidney	0.3			0.3
			(Total)	7.94E-04	NA	NA	7.94E-04	(Total)		8	NA	NA	8

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Table 6-49
Risk Assessment Summary
Reasonable Maximum Exposure
Future Resident Adult — Surface Soil (Exposed Soil Only), Sediment and Surface Water — Mill Pond, and Groundwater — Off-Site Floridan Aquifer
Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report
Baseline Human Health Risk Assessment
Former Thompson Industries Site
Madison, Florida

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Groundwater	Groundwater Off-Site Floridan Aquifer	*VOCs*					*VOCs*					
			Trichloroethene	1.30E-03		—	1.30E-03	Trichloroethene	liver/kidney	25		—	25
			Vinyl chloride (Chloroethene)	5.00E-06		—	5.00E-06						
			SVOCs										
			bis(2-Ethylhexyl)phthalate	2.48E-06		1.47E-07	2.63E-06						
			(Total)	1.30E-03	NA	1.47E-07	1.30E-03	(Total)		25	NA	0	25
	Air	Groundwater Water Vapors in Showerhead Off-Site Floridan Aquifer	*VOCs*					*VOCs*					
			Trichloroethene		1.30E-03		1.30E-03	Trichloroethene	NA		—		—
			Vinyl chloride (Chloroethene)		1.10E-07		1.10E-07						
			(Total)	NA	1.30E-03	NA	1.30E-03	(Total)		NA	0	NA	0

Total Risk Across Exposed Surface Soil	6.24E-06
Total Risk Across Sediment — Mill Pond	NA
Total Risk Across Surface Water — Mill Pond	8.00E-04
Total Risk Across Groundwater — Off-Site Floridan Aquifer	2.60E-03
Total Risk Across All Media and All Exposure Routes	3.41E-03

Total Hazard Index Across Exposed Surface Soil	NA
Total Hazard Index Across Sediment — Mill Pond	NA
Total Hazard Index Across Surface Water — Mill Pond	8
Total Hazard Index Across Groundwater — Off-Site Floridan Aquifer	25
Total Hazard Index Across All Media and All Exposure Routes	34

NA - Not Applicable

Target Organ HI per Medium

Organ	Soil	Sediment	Surface Water	Groundwater
kidney	NA	NA	0.3	25
liver	NA	NA	8	25

Total kidney HI	26
Total liver HI	34

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Table 6-50
Risk Assessment Summary
Reasonable Maximum Exposure
Future Resident Adult — Surface Soil, Sediment and Surface Water — Mill Pond, and Groundwater — Off-Site Floridan Aquifer
Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report
Baseline Human Health Risk Assessment
Former Thompson Industries Site
Madison, Florida

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	Surface Soil	*SVOCs*										
			Benzo(a)pyrene	1.26E-06		2.69E-07	1.53E-06						
			Inorganics										
			Arsenic	4.44E-06		9.51E-08	4.54E-06						
			Chromium	—		—	—						
			PCBs										
			Aroclor 1260	1.04E-06		2.23E-07	1.27E-06						
			(Total)	6.74E-06	NA	5.58E-07	7.33E-06	(Total)		NA	NA	NA	NA
	Air	Particulates from Surface Soil	*SVOCs*										
			Benzo(a)pyrene		3.30E-11		3.30E-11						
			Inorganics										
			Arsenic		2.77E-09		2.77E-09						
			Chromium		1.01E-06		1.01E-06						
			PCBs										
			Aroclor 1260		6.46E-11		6.46E-11						
			(Total)	NA	1.01E-06	NA	1.01E-06	(Total)		NA	NA	NA	NA
	Air	Vapors from Surface Soil	(Total)	NA	NA	NA	NA	(Total)		NA	NA	NA	NA
Sediment	Sediment	Sediment Mill Pond	(Total)	NA	NA	NA	NA	(Total)		NA	NA	NA	NA
Surface Water	Surface Water	Surface Water Mill Pond	*VOCs*					*SVOCs*					
			Vinyl chloride (Chloroethene)	3.19E-06		2.43E-06	5.62E-06	bis(2-Ethylhexyl)phthalate	liver	0.0007		0.002	0.003
			SVOCs					*Inorganics*					
			bis(2-Ethylhexyl)phthalate	8.67E-08		2.99E-07	3.86E-07	Iron	liver	0.002		0.0003	0.002
			Pesticides					*Pesticides*					
			beta-BHC	5.55E-08		1.09E-07	1.64E-07	beta-BHC	liver/kidney	0.0002		0.0005	0.0007
			(Total)	3.33E-06	NA	2.84E-06	6.17E-06	(Total)		0.003	NA	0.003	0.006

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Table 6-50
Risk Assessment Summary
Reasonable Maximum Exposure
Future Resident Adult — Surface Soil, Sediment and Surface Water — Mill Pond, and Groundwater — Off-Site Floridan Aquifer
Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report
Baseline Human Health Risk Assessment
Former Thompson Industries Site
Madison, Florida

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Water	Animal Tissue	Fish from Mill Pond	*VOCs*					*SVOCs*					
			Vinyl chloride (Chloroethene)	1.18E-05			1.18E-05	bis(2-Ethylhexyl)phthalate	liver	6			6
			SVOCs					*Inorganics*					
			bis(2-Ethylhexyl)phthalate	7.16E-04			7.16E-04	Iron	liver	2			2
			Pesticides					*Pesticides*					
			beta-BHC	6.64E-05			6.64E-05	beta-BHC	liver/kidney	0.3			0.3
			(Total)	7.94E-04	NA	NA	7.94E-04	(Total)		8	NA	NA	8
Groundwater	Groundwater	Groundwater Off-Site Floridan Aquifer	*VOCs*					*VOCs*					
			Trichloroethene	1.30E-03		—	1.30E-03	Trichloroethene	liver/kidney	25		—	25
			Vinyl chloride (Chloroethene)	5.00E-06		—	5.00E-06						
			SVOCs										
			bis(2-Ethylhexyl)phthalate	2.48E-06		1.47E-07	2.63E-06						
			(Total)	1.30E-03	NA	1.47E-07	1.30E-03	(Total)		25	NA	0	25
	Air	Groundwater Water Vapors at Showerhead Off-Site Floridan Aquifer	*VOCs*					*VOCs*					
			Trichloroethene		1.30E-03		1.30E-03	Trichloroethene	NA		—		—
			Vinyl chloride (Chloroethene)		1.10E-07		1.10E-07						
			(Total)	NA	1.30E-03	NA	1.30E-03	(Total)		NA	0	NA	0

Total Risk Across Surface Soil	8.34E-06
Total Risk Across Sediment — Mill Pond	NA
Total Risk Across Surface Water — Mill Pond	8.00E-04
Total Risk Across Groundwater — Off-Site Floridan Aquifer	2.60E-03
Total Risk Across All Media and All Exposure Routes	3.41E-03

Total Hazard Index Across Surface Soil	NA
Total Hazard Index Across Sediment — Mill Pond	NA
Total Hazard Index Across Surface Water — Mill Pond	8
Total Hazard Index Across Groundwater — Off-Site Floridan Aquifer	25
Total Hazard Index Across All Media and All Exposure Routes	34

NA - Not Applicable

Target Organ HI per Medium

Organ	Soil	Sediment	Surface Water	Groundwater	
kidney	NA	NA	0.3	25	Total kidney HI: 26
liver	NA	NA	8	25	Total liver HI: 34

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Table 6-51
Risk Assessment Summary
Reasonable Maximum Exposure
Future Resident Adult — Subsurface Soil (Exposed Soil Only), Sediment and Surface Water — Mill Pond, and Groundwater — Off-Site Floridan Aquifer
Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report
Baseline Human Health Risk Assessment
Former Thompson Industries Site
Madison, Florida

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Subsurface Soil	Subsurface Soil	Exposed Subsurface Soil	*Inorganics*										
			Arsenic	3.56E-06		7.62E-08	3.64E-06						
			(Total)	3.56E-06	NA	7.62E-08	3.64E-06	(Total)		NA	NA	NA	NA
	Air	Particulates from Exposed Subsurface Soil	*Inorganics*										
			Arsenic		2.22E-09		2.22E-09						
			(Total)	NA	2.22E-09	NA	2.22E-09	(Total)		NA	NA	NA	NA
	Air	Vapors from Exposed Subsurface Soil											
			(Total)	NA	NA	NA	NA	(Total)		NA	NA	NA	NA
Sediment	Sediment	Sediment Mill Pond											
			(Total)	NA	NA	NA	NA	(Total)		NA	NA	NA	NA
Surface Water	Surface Water	Surface Water Mill Pond	*VOCs*					*SVOCs*					
			Vinyl chloride (Chloroethene)	3.19E-06		2.43E-06	5.62E-06	bis(2-Ethylhexyl)phthalate	liver	0.0007		0.002	0.003
			SVOCs					*Inorganics*					
			bis(2-Ethylhexyl)phthalate	8.67E-08		2.99E-07	3.86E-07	Iron	liver	0.002		0.0003	0.002
			Pesticides					*Pesticides*					
			beta-BHC	5.55E-08		1.09E-07	1.64E-07	beta-BHC	liver/kidney	0.0002		0.0005	0.0007
			(Total)	3.33E-06	NA	2.84E-06	6.17E-06	(Total)		0.003	NA	0.003	0.006
	Animal Tissue	Fish from Mill Pond	*VOCs*					*SVOCs*					
			Vinyl chloride (Chloroethene)	1.18E-05			1.18E-05	bis(2-Ethylhexyl)phthalate	liver	6			6
			SVOCs					*Inorganics*					
			bis(2-Ethylhexyl)phthalate	7.16E-04			7.16E-04	Iron	liver	2			2
			Pesticides					*Pesticides*					
			beta-BHC	6.64E-05			6.64E-05	beta-BHC	liver/kidney	0.3			0.3
			(Total)	7.94E-04	NA	NA	7.94E-04	(Total)		8	NA	NA	8

Table 6-51
Risk Assessment Summary
Reasonable Maximum Exposure
Future Resident Adult — Subsurface Soil (Exposed Soil Only), Sediment and Surface Water — Mill Pond, and Groundwater — Off-Site Floridan Aquifer
Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report
Baseline Human Health Risk Assessment
Former Thompson Industries Site
Madison, Florida

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Groundwater	Groundwater Off-Site Floridan Aquifer	*VOCs*					*VOCs*					
			Trichloroethene	1.30E-03		—	1.30E-03	Trichloroethene	liver/kidney	25		—	25
			Vinyl chloride (Chloroethene)	5.00E-06		—	5.00E-06						
			SVOCs										
			bis(2-Ethylhexyl)phthalate	2.48E-06		1.47E-07	2.63E-06						
			(Total)	1.30E-03	NA	1.47E-07	1.30E-03	(Total)		25	NA	0	25
	Air	Groundwater Water Vapors at Showerhead Off-Site Floridan Aquifer	*VOCs*					*VOCs*					
			Trichloroethene		1.30E-03		1.30E-03	Trichloroethene	NA		—		—
			Vinyl chloride (Chloroethene)		1.10E-07		1.10E-07						
			(Total)	NA	1.30E-03	NA	1.30E-03	(Total)		NA	0	NA	0

Total Risk Across Exposed Subsurface Soil	3.64E-06
Total Risk Across Sediment — Mill Pond	NA
Total Risk Across Surface Water — Mill Pond	8.00E-04
Total Risk Across Groundwater — Off-Site Floridan Aquifer	2.60E-03
Total Risk Across All Media and All Exposure Routes	3.41E-03

Total Hazard Index Across Exposed Subsurface Soil	NA
Total Hazard Index Across Sediment — Mill Pond	NA
Total Hazard Index Across Surface Water — Mill Pond	8
Total Hazard Index Across Groundwater — Off-Site Floridan Aquifer	25
Total Hazard Index Across All Media and All Exposure Routes	34

NA - Not Applicable

Target Organ HI per Medium

Organ	Soil	Sediment	Surface Water	Groundwater
kidney	NA	NA	0.3	25
liver	NA	NA	8	25

Total kidney HI	26
Total liver HI	34

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Table 6-52
Risk Assessment Summary
Reasonable Maximum Exposure
Future Resident Adult — Subsurface Soil, Sediment and Surface Water — Mill Pond, and Groundwater — Off-Site Floridan Aquifer
Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report
Baseline Human Health Risk Assessment
Former Thompson Industries Site
Madison, Florida

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Subsurface Soil	Subsurface Soil	Subsurface Soil	*VOCs*										
			Vinyl chloride (Chloroethene)	6.20E-07		1.33E-07	7.52E-07						
			SVOCs										
			Benzo(a)pyrene	1.26E-06		2.69E-07	1.53E-06						
			Inorganics										
			Arsenic	3.22E-06		6.90E-08	3.29E-06						
			(Total)	5.10E-06	NA	4.71E-07	5.57E-06	(Total)		NA	NA	NA	NA
	Air	Particulates from Subsurface Soil	*SVOCs*										
			Benzo(a)pyrene		3.30E-11		3.30E-11						
			Inorganics										
			Arsenic		2.01E-09		2.01E-09						
			(Total)	NA	2.04E-09	NA	2.04E-09	(Total)		NA	NA	NA	NA
	Air	Vapors from Subsurface Soil	*VOCs*										
			Vinyl chloride (Chloroethene)		1.18E-06		1.18E-06						
			(Total)	NA	1.18E-06	NA	1.18E-06	(Total)		NA	NA	NA	NA
Sediment	Sediment	Sediment Mill Pond											
			(Total)	NA	NA	NA	NA	(Total)		NA	NA	NA	NA
Surface Water	Surface Water	Surface Water Mill Pond	*VOCs*					*SVOCs*					
			Vinyl chloride (Chloroethene)	3.19E-06		2.43E-06	5.62E-06	bis(2-Ethylhexyl)phthalate	liver	0.0007		0.002	0.003
			SVOCs					*Inorganics*					
			bis(2-Ethylhexyl)phthalate	8.67E-08		2.99E-07	3.86E-07	Iron	liver	0.002		0.0003	0.002
			Pesticides					*Pesticides*					
			beta-BHC	5.55E-08		1.09E-07	1.64E-07	beta-BHC	liver/kidney	0.0002		0.0005	0.0007
			(Total)	3.33E-06	NA	2.84E-06	6.17E-06	(Total)		0.003	NA	0.003	0.006
	Animal Tissue	Fish from Mill Pond	*VOCs*					*SVOCs*					
			Vinyl chloride (Chloroethene)	1.18E-05			1.18E-05	bis(2-Ethylhexyl)phthalate	liver	6			6
			SVOCs					*Inorganics*					
			bis(2-Ethylhexyl)phthalate	7.16E-04			7.16E-04	Iron	liver	2			2
			Pesticides					*Pesticides*					
			beta-BHC	6.64E-05			6.64E-05	beta-BHC	liver/kidney	0.3			0.3
			(Total)	7.94E-04	NA	NA	7.94E-04	(Total)		8	NA	NA	8

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Table 6-52
Risk Assessment Summary
Reasonable Maximum Exposure
Future Resident Adult — Subsurface Soil, Sediment and Surface Water — Mill Pond, and Groundwater — Off-Site Floridan Aquifer
Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report
Baseline Human Health Risk Assessment
Former Thompson Industries Site
Madison, Florida

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Groundwater	Groundwater Off-Site Floridan Aquifer	VOCs					VOCs					
			Trichloroethene	1.30E-03		—	1.30E-03	Trichloroethene	liver/kidney	25		—	25
			Vinyl chloride (Chloroethene)	5.00E-06		—	5.00E-06						
			SVOCs										
			bis(2-Ethylhexyl)phthalate	2.48E-06		1.47E-07	2.63E-06						
			(Total)	1.30E-03	NA	1.47E-07	1.30E-03	(Total)		25	NA	0	25
	Air	Groundwater Water Vapors in Shower-head Off-Site Floridan Aquifer	VOCs					VOCs					
			Trichloroethene		1.30E-03		1.30E-03	Trichloroethene	NA		—		—
			Vinyl chloride (Chloroethene)		1.10E-07		1.10E-07						
			(Total)	NA	1.30E-03	NA	1.30E-03	(Total)		NA	0	NA	0
						Total Risk Across Subsurface Soil	6.75E-06					Total Hazard Index Across Subsurface Soil	NA
						Total Risk Across Sediment — Mill Pond	NA					Total Hazard Index Across Sediment — Mill Pond	NA
						Total Risk Across Surface Water — Mill Pond	8.00E-04					Total Hazard Index Across Surface Water — Mill Pond	8
						Total Risk Across Groundwater — Off-Site Floridan Aquifer	2.60E-03					Total Hazard Index Across Groundwater — Off-Site Floridan Aquifer	25
						Total Risk Across All Media and All Exposure Routes	3.41E-03					Total Hazard Index Across All Media and All Exposure Routes	34

NA - Not Applicable

Target Organ HI per Medium

Organ	Soil	Sediment	Surface Water	Groundwater	
kidney	NA	NA	0.3	25	Total kidney HI: 26
liver	NA	NA	8	25	Total liver HI: 34

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Table 6-53
Risk Assessment Summary
Reasonable Maximum Exposure
Future Resident Child — Surface Soil (Exposed Soil Only), Sediment and Surface Water — Mill Pond, and Groundwater — On-Site Surficial Aquifer
Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report
Baseline Human Health Risk Assessment
Former Thompson Industries Site
Madison, Florida

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Child

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	Exposed Surface Soil						*Inorganics*					
								Aluminum	CNS	2		0.02	2
								Chromium	nose	0.6		0.2	0.8
								Iron	liver	0.4		0.004	0.4
			(Total)	NA	NA	NA	NA	(Total)		3	NA	0.2	3
	Air	Particulates from Exposed Surface Soil						*Inorganics*					
								Aluminum	ND		0.09		0.09
								Iron	NA		—		—
			(Total)	NA	NA	NA	NA	(Total)		NA	0.09	NA	0.09
	Air	Vapors from Exposed Surface Soil											
			(Total)	NA	NA	NA	NA	(Total)		NA	NA	NA	NA
Sediment	Sediment	Sediment Mill Pond											
			(Total)	NA	NA	NA	NA	(Total)		NA	NA	NA	NA
Surface Water	Surface Water	Surface Water Mill Pond						*SVOCs*					
								bis(2-Ethylhexyl)phthalate	liver	0.003		0.004	0.007
								Inorganics					
								Iron	liver	0.007		0.0004	0.008
								Pesticides					
								beta-BHC	liver/kidney	0.001		0.0007	0.002
			(Total)	NA	NA	NA	NA	(Total)		0.01	NA	0.005	0.02
	Animal Tissue	Fish Tissue from Mill Pond						*SVOCs*					
								bis(2-Ethylhexyl)phthalate	liver	9			9
								Inorganics					
								Iron	liver	3			3
								Pesticides					
								beta-BHC	liver/kidney	0.5			0.5
			(Total)	NA	NA	NA	NA	(Total)		13	NA	NA	13

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Table 6-53
Risk Assessment Summary
Reasonable Maximum Exposure
Future Resident Child — Surface Soil (Exposed Soil Only), Sediment and Surface Water — Mill Pond, and Groundwater — On-Site Surficial Aquifer
Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report
Baseline Human Health Risk Assessment
Former Thompson Industries Site
Madison, Florida

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Child

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Groundwater	Groundwater On-Site Surficial Aquifer						VOCs					
								Benzene	ND	0.1		—	0.1
								Chloroform	liver	0.002		—	0.002
								cis-1,2-Dichloroethene	blood	5		—	5
								Trichloroethene	liver/kidney	166		—	166
								Vinyl chloride (Chloroethene)	liver	20		—	20
								Inorganics					
								Iron	liver	4		0.009	4
								Manganese	CNS	3		0.2	3
			(Total)	NA	NA	NA	NA	(Total)		198	NA	0.2	198
	Air	Groundwater Water Vapors at Showerhead On-Site Surficial Aquifer						VOCs					
								Benzene	ND		0.2		0.2
								Chloroform	ND		0.2		0.2
								cis-1,2-Dichloroethene	NA		—		—
								Trichloroethene	NA		—		—
								Vinyl chloride (Chloroethene)	liver		2		2
			(Total)	NA	NA	NA	NA	(Total)		NA	2	NA	2
						Total Risk Across Exposed Surface Soil	NA					Total Hazard Index Across Exposed Surface Soil	3
						Total Risk Across Sediment — Mill Pond	NA					Total Hazard Index Across Sediment — Mill Pond	NA
						Total Risk Across Surface Water — Mill Pond	NA					Total Hazard Index Across Surface Water — Mill Pond	13
						Total Risk Across Groundwater — On-Site Surficial Aquifer	NA					Total Hazard Index Across Groundwater — On-Site Surficial Aquifer	201
						Total Risk Across All Media and All Exposure Routes	NA					Total Hazard Index Across All Media and All Exposure Routes	217

NA - Not Applicable
ND - No Data
CNS - Central Nervous System

Target Organ HI per Medium

Organ	Soil	Sediment	Surface Water	Groundwater	
blood	NA	NA	NA	5	Total blood HI: 5
CNS	2	NA	NA	3	Total CNS HI: 5
kidney	NA	NA	0.5	166	Total kidney HI: 167
liver	0.4	NA	13	192	Total liver HI: 206
none/ND	0.9	NA	NA	0.5	Total none/ND HI: 1

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Table 6-54
Risk Assessment Summary
Reasonable Maximum Exposure
Future Resident Child — Surface Soil, Sediment and Surface Water — Mill Pond, and Groundwater — On-Site Surficial Aquifer
Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report
Baseline Human Health Risk Assessment
Former Thompson Industries Site
Madison, Florida

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Child

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	Surface Soil						*Inorganics*					
								Aluminum	CNS	0.1		0.001	0.1
								Chromium	none	1		0.4	1
								Iron	liver	0.4		0.004	0.4
								Thallium	blood	0.1		0.0009	0.1
			(Total)	NA	NA	NA	NA	(Total)		2	NA	0.4	2
	Air	Particulates from Surface Soil						*Inorganics*					
								Aluminum	ND		0.006		0.006
								Iron	NA		—		—
								Thallium	NA		—		—
			(Total)	NA	NA	NA	NA	(Total)		NA	0.006	NA	0.006
	Air	Vapors from Surface Soil											
			(Total)	NA	NA	NA	NA	(Total)		NA	NA	NA	NA
Sediment	Sediment	Sediment Mill Pond											
			(Total)	NA	NA	NA	NA	(Total)		NA	NA	NA	NA
Surface Water	Surface Water	Surface Water Mill Pond						*SVOCs*					
								bis(2-Ethylhexyl)phthalate	liver	0.003		0.004	0.007
								Inorganics					
								Iron	liver	0.007		0.0004	0.008
								Pesticides					
			(Total)	NA	NA	NA	NA	beta-BHC	liver/kidney	0.001		0.0007	0.002
								(Total)		0.01	NA	0.005	0.02
	Animal Tissue	Surface Water Mill Pond						*SVOCs*					
								bis(2-Ethylhexyl)phthalate	liver	9	-		9
								Inorganics					
								Iron	liver	3			3
								Pesticides					
			(Total)	NA	NA	NA	NA	beta-BHC	liver/kidney	0.5			0.5
								(Total)		13	NA	NA	13

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Table 6-54
Risk Assessment Summary
Reasonable Maximum Exposure
Future Resident Child — Surface Soil, Sediment and Surface Water — Mill Pond, and Groundwater — On-Site Surficial Aquifer
Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report
Baseline Human Health Risk Assessment
Former Thompson Industries Site
Madison, Florida

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Child

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Groundwater	Groundwater On-Site Surficial Aquifer						*VOCs*					
								Benzene	ND	0.1		—	0.1
								Chloroform	liver	0.002		—	0.002
								cis-1,2-Dichloroethene	blood	5		—	5
								Trichloroethene	liver/kidney	166		—	166
								Vinyl chloride (Chloroethene)	liver	20		—	20
								Inorganics					
								Iron	liver	4		0.009	4
								Manganese	CNS	3		0.2	3
			(Total)	NA	NA	NA	NA	(Total)		198	NA	0.2	198
	Air	Groundwater Water Vapors at Showerhead On-Site Surficial Aquifer						*VOCs*					
								Benzene	ND		0.2		0.2
								Chloroform	ND		0.2		0.2
								cis-1,2-Dichloroethene	NA		—		—
								Trichloroethene	NA		—		—
								Vinyl chloride (Chloroethene)	liver		2		2
			(Total)	NA	NA	NA	NA	(Total)		NA	2	NA	2
						Total Risk Across Surface Soil	NA					Total Hazard Index Across Surface Soil	2
						Total Risk Across Sediment — Mill Pond	NA					Total Hazard Index Across Sediment — Mill Pond	NA
						Total Risk Across Surface Water — Mill Pond	NA					Total Hazard Index Across Surface Water — Mill Pond	13
						Total Risk Across Groundwater — On-Site Surficial Aquifer	NA					Total Hazard Index Across Groundwater — On-Site Surficial Aquifer	201
						Total Risk Across All Media and All Exposure Routes	NA					Total Hazard Index Across All Media and All Exposure Routes	216

NA - Not Applicable
ND - No Data
CNS - Central Nervous System

Target Organ HI per Medium

Organs	Soil	Sediment	Surface Water	Groundwater
blood	0.1	NA	NA	5
CNS	0.1	NA	NA	3
kidney	NA	NA	0.5	166
liver	0.4	NA	13	192
none/ND	1	NA	NA	0.5

Total blood HI	5
Total CNS HI	3
Total kidney HI	167
Total liver HI	206
Total none/ND HI	2

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Table 6-55
Risk Assessment Summary
Reasonable Maximum Exposure
Future Resident Child — Subsurface Soil (Exposed Soil Only), Sediment and Surface Water — Mill Pond, and Groundwater — On-Site Surficial Aquifer
Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report
Baseline Human Health Risk Assessment
Former Thompson Industries Site
Madison, Florida

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Child

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Subsurface Soil	Subsurface Soil	Exposed Subsurface Soil						*Inorganics*					
								Aluminum	CNS	0.7		0.007	0.7
								Iron	liver	0.2		0.002	0.2
			(Total)	NA	NA	NA	NA	(Total)		1	NA	0.009	1
	Air	Particulates from Exposed Subsurface Soil						*Inorganics*					
								Iron	NA		—		—
			(Total)	NA	NA	NA	NA	(Total)		NA	0	NA	0
	Air	Vapors from Exposed Subsurface Soil	(Total)	NA	NA	NA	NA	(Total)		NA	NA	NA	NA
Sediment	Sediment	Sediment Mill Pond	(Total)	NA	NA	NA	NA	(Total)		NA	NA	NA	NA
Surface Water	Surface Water	Surface Water Mill Pond						*SVOCs*					
								bis(2-Ethylhexyl)phthalate	liver	0.003		0.004	0.007
								Inorganics					
								Iron	liver	0.007		0.0004	0.008
								Pesticides					
			(Total)	NA	NA	NA	NA	beta-BHC	liver/kidney	0.001		0.0007	0.002
								(Total)		0.01	NA	0.005	0.02
	Animal Tissue	Fish Tissue from Mill Pond						*SVOCs*					
								bis(2-Ethylhexyl)phthalate	liver	9			9
								Inorganics					
								Iron	liver	3			3
								Pesticides					
			(Total)	NA	NA	NA	NA	beta-BHC	liver/kidney	0.5			0.5
								(Total)		13	NA	NA	13

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Table 6-55
Risk Assessment Summary
Reasonable Maximum Exposure
Future Resident Child — Subsurface Soil (Exposed Soil Only), Sediment and Surface Water — Mill Pond, and Groundwater — On-Site Surficial Aquifer
Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report
Baseline Human Health Risk Assessment
Former Thompson Industries Site
Madison, Florida

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Child

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Groundwater	Groundwater On-Site Surficial Aquifer						*VOCs*					
								cis-1,2-Dichloroethene	blood	5		—	5
								Trichloroethene	liver/kidney	166		—	166
								Vinyl chloride (Chloroethene)	liver	20		—	20
								Inorganics					
								Iron	liver	4		0.009	4
								Manganese	CNS	3		0.2	3
			(Total)	NA	NA	NA	NA	(Total)		198	NA	0.2	198
	Air	Groundwater Water Vapors at Showerhead On-Site Surficial Aquifer						*VOCs*					
								cis-1,2-Dichloroethene	NA		—		—
								Trichloroethene	NA		—		—
								Vinyl chloride (Chloroethene)	liver		2		2
			(Total)	NA	NA	NA	NA	(Total)		NA	2	NA	2

Total Risk Across Exposed Subsurface Soil	NA
Total Risk Across Sediment — Mill Pond	NA
Total Risk Across Surface Water — Mill Pond	NA
Total Risk Across Groundwater — On-Site Surficial Aquifer	NA
Total Risk Across All Media and All Exposure Routes	NA

Total Hazard Index Across Exposed Subsurface Soil	1
Total Hazard Index Across Sediment — Mill Pond	NA
Total Hazard Index Across Surface Water — Mill Pond	13
Total Hazard Index Across Groundwater — On-Site Surficial Aquifer	200
Total Hazard Index Across All Media and All Exposure Routes	214

NA - Not Applicable
CNS - Central Nervous System

Target Organ HI per Medium

Organ	Soil	Sediment	Surface Water	Groundwater		
blood	NA	NA	NA	5	Total blood HI	5
CNS	0.7	NA	NA	3	Total CNS HI	4
kidney	NA	NA	0.5	166	Total kidney HI	167
liver	0.2	NA	13	192	Total liver HI	205

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Table 6-56
Risk Assessment Summary
Reasonable Maximum Exposure
Future Resident Child — Subsurface Soil, Sediment and Surface Water — Mill Pond, and Groundwater — On-Site Surficial Aquifer
Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report
Baseline Human Health Risk Assessment
Former Thompson Industries Site
Madison, Florida

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Child

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Subsurface Soil	Subsurface Soil	Subsurface Soil						*Inorganics*					
								Iron	liver	0.3		0.002	0.3
			(Total)	NA	NA	NA	NA	(Total)		0.3	NA	0.002	0.3
	Air	Particulates from Subsurface Soil						*Inorganics*					
								Iron	NA		—		—
			(Total)	NA	NA	NA	NA	(Total)		NA	0	NA	0
	Air	Vapors from Subsurface Soil											
			(Total)	NA	NA	NA	NA	(Total)		NA	NA	NA	NA
Sediment	Sediment	Sediment Mill Pond											
			(Total)	NA	NA	NA	NA	(Total)		NA	NA	NA	NA
Surface Water	Surface Water	Surface Water Mill Pond						*SVOCs*					
								bis(2-Ethylhexyl)phthalate	liver	0.003		0.004	0.007
								Inorganics					
								Iron	liver	0.007		0.0004	0.008
								Pesticides					
								beta-BHC	liver/kidney	0.001		0.0007	0.002
			(Total)	NA	NA	NA	NA	(Total)		0.01	NA	0.005	0.02
	Animal Tissue	Fish from Mill Pond						*SVOCs*					
								bis(2-Ethylhexyl)phthalate	liver	9			9
								Inorganics					
								Iron	liver	3			3
								Pesticides					
								beta-BHC	liver/kidney	0.5			0.5
			(Total)	NA	NA	NA	NA	(Total)		13	NA	NA	13

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Table 6-56
Risk Assessment Summary
Reasonable Maximum Exposure
Future Resident Child — Subsurface Soil, Sediment and Surface Water — Mill Pond, and Groundwater — On-Site Surficial Aquifer
Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report
Baseline Human Health Risk Assessment
Former Thompson Industries Site
Madison, Florida

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Child

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Groundwater	Groundwater On-Site Surficial Aquifer						*VOCs*					
								cis-1,2-Dichloroethene	blood	5		—	5
								Trichloroethene	liver/kidney	166		—	166
								Vinyl chloride (Chloroethene)	liver	20		—	20
								Inorganics					
								Iron	liver	4		0.009	4
								Manganese	CNS	3		0.2	3
			(Total)	NA	NA	NA	NA	(Total)		198	NA	0.2	198
	Air	Groundwater Water Vapors at Showerhead On-Site Surficial Aquifer						*VOCs*					
								cis-1,2-Dichloroethene	NA		—		—
								Trichloroethene	NA		—		—
								Vinyl chloride (Chloroethene)	liver		2		2
			(Total)	NA	NA	NA	NA	(Total)		NA	2	NA	2

Total Risk Across Subsurface Soil	NA
Total Risk Across Sediment — Mill Pond	NA
Total Risk Across Surface Water — Mill Pond	NA
Total Risk Across Groundwater — On-Site Surficial Aquifer	NA
Total Risk Across All Media and All Exposure Routes	NA

Total Hazard Index Across Subsurface Soil	0.3
Total Hazard Index Across Sediment — Mill Pond	NA
Total Hazard Index Across Surface Water — Mill Pond	13
Total Hazard Index Across Groundwater — On-Site Surficial Aquifer	200
Total Hazard Index Across All Media and All Exposure Routes	214

NA - Not Applicable
CNS - Central Nervous System

Target Organ HI per Medium

Organ	Soil	Sediment	Surface Water	Groundwater
blood	NA	NA	NA	5
CNS	NA	NA	NA	3
kidney	NA	NA	0.5	166
liver	0.3	NA	13	192

Total blood HI	5
Total CNS HI	3
Total kidney HI	167
Total liver HI	205

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Table 6-57
Risk Assessment Summary
Reasonable Maximum Exposure
Future Resident Child — Surface Soil (Exposed Soil Only), Sediment and Surface Water — Mill Pond, and Groundwater — Off-Site Surficial Aquifer
Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report
Baseline Human Health Risk Assessment
Former Thompson Industries Site
Madison, Florida

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Child

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	Exposed Surface Soil						*Inorganics*					
								Aluminum	CNS	2		0.02	2
								Chromium	none	0.6		0.2	0.8
								Iron	liver	0.4		0.004	0.4
			(Total)	NA	NA	NA	NA	(Total)		3	NA	0.2	3
	Air	Particulates from Exposed Surface Soil						*Inorganics*					
								Aluminum	ND		0.09		0.09
								Iron	NA		—		—
			(Total)	NA	NA	NA	NA	(Total)		NA	0.09	NA	0.09
	Air	Vapors from Exposed Surface Soil											
			(Total)	NA	NA	NA	NA	(Total)		NA	NA	NA	NA
Sediment	Sediment	Sediment Mill Pond											
			(Total)	NA	NA	NA	NA	(Total)		NA	NA	NA	NA
Surface Water	Surface Water	Surface Water Mill Pond						*SVOCs*					
								bis(2-Ethylhexyl)phthalate	liver	0.003		0.004	0.007
								Inorganics					
								Iron	liver	0.007		0.0004	0.008
								Pesticides					
								beta-BHC	liver/kidney	0.001		0.0007	0.002
			(Total)	NA	NA	NA	NA	(Total)		0.01	NA	0.005	0.02
	Animal Tissue	Fish Tissue from Mill Pond						*SVOCs*					
								bis(2-Ethylhexyl)phthalate	liver	9			9
								Inorganics					
								Iron	liver	3			3
								Pesticides					
								beta-BHC	liver/kidney	0.5			0.5
			(Total)	NA	NA	NA	NA	(Total)		13	NA	NA	13

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Table 6-57
Risk Assessment Summary
Reasonable Maximum Exposure
Future Resident Child — Surface Soil (Exposed Soil Only), Sediment and Surface Water — Mill Pond, and Groundwater — Off-Site Surficial Aquifer
Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report
Baseline Human Health Risk Assessment
Former Thompson Industries Site
Madison, Florida

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Child

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Groundwater	Groundwater Off-Site Surficial Aquifer						*VOCs*					
								cis-1,2-Dichloroethene	blood	3		—	3
								Trichloroethene	liver/kidney	113		—	113
								Vinyl chloride (Chloroethene)	liver	7		—	7
								Inorganics					
								Chromium	none	1		0.09	1
								Iron	liver	1		0.002	1
								Manganese	CNS	0.3		0.01	0.3
			(Total)	NA	NA	NA	NA	(Total)		125	NA	0.1	125
	Air	Groundwater Water Vapors at Showerhead Off-Site Surficial Aquifer						*VOCs*					
								cis-1,2-Dichloroethene	NA		—		—
								Trichloroethene	NA		—		—
								Vinyl chloride (Chloroethene)	liver		0.7		0.7
			(Total)	NA	NA	NA	NA	(Total)		NA	0.7	NA	0.7

Total Risk Across Exposed Surface Soil	NA
Total Risk Across Sediment — Mill Pond	NA
Total Risk Across Surface Water — Mill Pond	NA
Total Risk Across Groundwater — Off-Site Surficial Aquifer	NA
Total Risk Across All Media and All Exposure Routes	NA

Total Hazard Index Across Exposed Surface Soil	3
Total Hazard Index Across Sediment — Mill Pond	NA
Total Hazard Index Across Surface Water — Mill Pond	13
Total Hazard Index Across Groundwater — Off-Site Surficial Aquifer	126
Total Hazard Index Across All Media and All Exposure Routes	142

NA - Not Applicable
ND - No Data
CNS - Central Nervous System

Target Organ HI per Medium

Organ	Soil	Sediment	Surface Water	Groundwater
blood	NA	NA	NA	3
CNS	2	NA	NA	0.3
kidney	NA	NA	0.5	113
liver	0.4	NA	13	121
none/ND	0.9	NA	NA	1

Total blood HI	3
Total CNS HI	2
Total kidney HI	114
Total liver HI	135
Total none/ND HI	2

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Table 6-58
Risk Assessment Summary
Reasonable Maximum Exposure
Future Resident Child — Surface Soil, Sediment and Surface Water — Mill Pond, and Groundwater — Off-Site Surficial Aquifer
Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report
Baseline Human Health Risk Assessment
Former Thompson Industries Site
Madison, Florida

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Child

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	Surface Soil						*Inorganics*					
								Chromium	none	1		0.4	1
								Iron	liver	0.4		0.004	0.4
								Thallium	blood	0.1		0.0009	0.1
			(Total)	NA	NA	NA	NA	(Total)		2	NA	0.4	2
	Air	Particulates from Surface Soil						*Inorganics*					
								Iron	NA		—		—
								Thallium	NA		—		—
			(Total)	NA	NA	NA	NA	(Total)		NA	0	NA	0
	Air	Vapors from Surface Soil											
			(Total)	NA	NA	NA	NA	(Total)		NA	NA	NA	NA
Sediment	Sediment	Sediment Mill Pond											
			(Total)	NA	NA	NA	NA	(Total)		NA	NA	NA	NA
Surface Water	Surface Water	Surface Water Mill Pond						*SVOCs*					
								bis(2-Ethylhexyl)phthalate	liver	0.003		0.004	0.007
								Inorganics					
								Iron	liver	0.007		0.0004	0.008
								Pesticides					
								beta-BHC	liver/kidney	0.001		0.0007	0.002
			(Total)	NA	NA	NA	NA	(Total)		0.01	NA	0.005	0.02
	Animal Tissue	Surface Water Mill Pond						*SVOCs*					
								bis(2-Ethylhexyl)phthalate	liver	9			9
								Inorganics					
								Iron	liver	3			3
								Pesticides					
								beta-BHC	liver/kidney	0.5			0.5
			(Total)	NA	NA	NA	NA	(Total)		13	NA	NA	13

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Table 6-S8
Risk Assessment Summary
Reasonable Maximum Exposure
Future Resident Child — Surface Soil, Sediment and Surface Water — Mill Pond, and Groundwater — Off-Site Surficial Aquifer
Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report
Baseline Human Health Risk Assessment
Former Thompson Industries Site
Madison, Florida

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Child

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Groundwater	Groundwater - Off-Site Surficial Aquifer						VOCs					
								cis-1,2-Dichloroethene	blood	3		—	3
								Trichloroethene	liver/kidney	113		—	113
								Vinyl chloride (Chloroethene)	liver	7		—	7
								Inorganics					
								Chromium	none	1		0.09	1
								Iron	liver	1		0.002	1
			(Total)	NA	NA	NA	NA	(Total)		125	NA	0.09	125
	Air	Groundwater - Water Vapors at Showerhead Off-Site Surficial Aquifer						VOCs					
								cis-1,2-Dichloroethene	NA		—		—
								Trichloroethene	NA		—		—
								Vinyl chloride (Chloroethene)	liver		0.7		0.7
			(Total)	NA	NA	NA	NA	(Total)		NA	0.7	NA	0.7

Total Risk Across Surface Soil	NA
Total Risk Across Sediment — Mill Pond	NA
Total Risk Across Surface Water — Mill Pond	NA
Total Risk Across Groundwater — Off-Site Surficial Aquifer	NA
Total Risk Across All Media and All Exposure Routes	NA

Total Hazard Index Across Surface Soil	2
Total Hazard Index Across Sediment — Mill Pond	NA
Total Hazard Index Across Surface Water — Mill Pond	13
Total Hazard Index Across Groundwater — Off-Site Surficial Aquifer	126
Total Hazard Index Across All Media and All Exposure Routes	141

NA - Not Applicable
ND - No Data

Target Organ HI per Medium

Organ	Soil	Sediment	Surface Water	Groundwater
blood	0.1	NA	NA	3
kidney	NA	NA	0.5	113
liver	0.4	NA	13	121
none/ND	1	NA	NA	1

Total blood HI	3
Total kidney HI	114
Total liver HI	135
Total none/ND HI	3

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Table 6-59
Risk Assessment Summary
Reasonable Maximum Exposure
Future Resident Child — Subsurface Soil (Exposed Soil Only), Sediment and Surface Water — Mill Pond, and Groundwater — Off-Site Surficial Aquifer
Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report
Baseline Human Health Risk Assessment
Former Thompson Industries Site
Madison, Florida

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Child

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Subsurface Soil	Subsurface Soil	Exposed Subsurface Soil						*Inorganics*					
								Chromium	none	0.6		0.2	0.8
								Iron	liver	0.2		0.002	0.2
			(Total)	NA	NA	NA	NA	(Total)		1	NA	0.2	1
	Air	Particulates from Exposed Subsurface Soil						*Inorganics*					
								Iron	NA		—		—
			(Total)	NA	NA	NA	NA	(Total)		NA	0	NA	0
	Air	Vapors from Exposed Subsurface Soil											
			(Total)	NA	NA	NA	NA	(Total)		NA	NA	NA	NA
Sediment	Sediment	Sediment Mill Pond											
			(Total)	NA	NA	NA	NA	(Total)		NA	NA	NA	NA
Surface Water	Surface Water	Surface Water Mill Pond						*SVOCs*					
								bis(2-Ethylhexyl)phthalate	liver	0.003		0.004	0.007
								Inorganics					
								Iron	liver	0.007		0.0004	0.008
								Pesticides					
								beta-BHC	liver/kidney	0.001		0.0007	0.002
			(Total)	NA	NA	NA	NA	(Total)		0.01	NA	0.005	0.02
	Animal Tissue	Fish Tissue from Mill Pond						*SVOCs*					
								bis(2-Ethylhexyl)phthalate	liver	9			9
								Inorganics					
								Iron	liver	3			3
								Pesticides					
								beta-BHC	liver/kidney	0.5			0.5
			(Total)	NA	NA	NA	NA	(Total)		13	NA	NA	13

Table 6-59
Risk Assessment Summary
Reasonable Maximum Exposure
Future Resident Child — Subsurface Soil (Exposed Soil Only), Sediment and Surface Water — Mill Pond, and Groundwater — Off-Site Surficial Aquifer
Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report
Baseline Human Health Risk Assessment
Former Thompson Industries Site
Madison, Florida

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Child

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Groundwater	Groundwater Off-Site Surficial Aquifer						VOCs					
								cis-1,2-Dichloroethene	blood	3		—	3
								Trichloroethene	liver/kidney	113		—	113
								Vinyl chloride (Chloroethene)	liver	7		—	7
								Inorganics					
								Chromium	nose	1		0.09	1
								Iron	liver	1		0.002	1
			(Total)	NA	NA	NA	NA	(Total)		125	NA	0.09	125
	Air	Groundwater Water Vapors at Showerhead Off-Site Surficial Aquifer						VOCs					
								cis-1,2-Dichloroethene	NA		—		—
								Trichloroethene	NA		—		—
								Vinyl chloride (Chloroethene)	liver		0.7		0.7
			(Total)	NA	NA	NA	NA	(Total)		NA	0.7	NA	0.7

Total Risk Across Exposed Subsurface Soil	NA
Total Risk Across Sediment — Mill Pond	NA
Total Risk Across Surface Water — Mill Pond	NA
Total Risk Across Groundwater — Off-Site Surficial Aquifer	NA
Total Risk Across All Media and All Exposure Routes	NA

Total Hazard Index Across Exposed Subsurface Soil	1
Total Hazard Index Across Sediment — Mill Pond	NA
Total Hazard Index Across Surface Water — Mill Pond	13
Total Hazard Index Across Groundwater — Off-Site Surficial Aquifer	126
Total Hazard Index Across All Media and All Exposure Routes	140

NA - Not Applicable
ND - No Data

Target Organ HI per Medium

Organ	Soil	Sediment	Surface Water	Groundwater
blood	NA	NA	NA	3
kidney	NA	NA	0.5	113
liver	0.2	NA	13	121
none/ND	0.8	NA	NA	1

Total blood HI	3
Total kidney HI	114
Total liver HI	135
Total none/ND HI	2

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Table 6-60
Risk Assessment Summary
Reasonable Maximum Exposure
Future Resident Child — Subsurface Soil, Sediment and Surface Water — Mill Pond, and Groundwater — Off-Site Surficial Aquifer
Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report
Baseline Human Health Risk Assessment
Former Thompson Industries Site
Madison, Florida

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Child

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Subsurface Soil	Subsurface Soil	Subsurface Soil						*Inorganics*					
								Chromium	none	0.4		0.2	0.6
								Iron	liver	0.3		0.002	0.3
			(Total)	NA	NA	NA	NA	(Total)		0.7	NA	0.2	0.9
	Air	Particulates from Subsurface Soil						*Inorganics*					
								Iron	NA		—		—
			(Total)	NA	NA	NA	NA	(Total)		NA	0	NA	0
	Air	Vapors from Subsurface Soil											
			(Total)	NA	NA	NA	NA	(Total)		NA	NA	NA	NA
Sediment	Sediment	Sediment Mill Pond											
			(Total)	NA	NA	NA	NA	(Total)		NA	NA	NA	NA
Surface Water	Surface Water	Surface Water Mill Pond						*SVOCs*					
								bis(2-Ethylhexyl)phthalate	liver	0.003		0.004	0.007
								Inorganics					
								Iron	liver	0.007		0.0004	0.008
								Pesticides					
								beta-BHC	liver/kidney	0.001		0.0007	0.002
			(Total)	NA	NA	NA	NA	(Total)		0.01	NA	0.005	0.02
	Animal Tissue	Fish from Mill Pond						*SVOCs*					
								bis(2-Ethylhexyl)phthalate	liver	9			9
								Inorganics					
								Iron	liver	3			3
								Pesticides					
								beta-BHC	liver/kidney	0.5			0.5
			(Total)	NA	NA	NA	NA	(Total)		13	NA	NA	13

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Table 6-60
Risk Assessment Summary
Reasonable Maximum Exposure
Future Resident Child — Subsurface Soil, Sediment and Surface Water — Mill Pond, and Groundwater — Off-Site Surficial Aquifer
Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report
Baseline Human Health Risk Assessment
Former Thompson Industries Site
Madison, Florida

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Child

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk			
				Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Groundwater	Groundwater - Off-Site Surficial Aquifer					
			(Total)	NA	NA	NA	NA
	Air	Groundwater Water Vapors at Showerhead Off-Site Surficial Aquifer					
			(Total)	NA	NA	NA	NA

Chemical	Non-Carcinogenic Hazard Quotient				
	Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
VOCs					
cis-1,2-Dichloroethene	blood	3		—	3
Trichloroethene	liver/kidney	113		—	113
Vinyl chloride (Chloroethene)	liver	7		—	7
Inorganics					
Chromium	none	1		0.09	1
Iron	liver	1		0.002	1
(Total)		125	NA	0.09	125
VOCs					
cis-1,2-Dichloroethene	NA		—		—
Trichloroethene	NA		—		—
Vinyl chloride (Chloroethene)	liver		0.7		0.7
(Total)		NA	0.7	NA	0.7

Total Risk Across Subsurface Soil	NA
Total Risk Across Sediment — Mill Pond	NA
Total Risk Across Surface Water — Mill Pond	NA
Total Risk Across Groundwater — Off-Site Surficial Aquifer	NA
Total Risk Across All Media and All Exposure Routes	NA

Total Hazard Index Across Subsurface Soil	0.9
Total Hazard Index Across Sediment — Mill Pond	NA
Total Hazard Index Across Surface Water — Mill Pond	13
Total Hazard Index Across Groundwater — Off-Site Surficial Aquifer	126
Total Hazard Index Across All Media and All Exposure Routes	140

NA - Not Applicable
ND - No Data

Target Organ HI per Medium

Organs	Soil	Sediment	Surface Water	Groundwater
blood	NA	NA	NA	3
kidney	NA	NA	0.5	113
liver	0.3	NA	13	121
none/ND	0.6	NA	NA	1

Total blood HI	3
Total kidney HI	114
Total liver HI	135
Total none/ND HI	2

Table 6-61
Risk Assessment Summary
Reasonable Maximum Exposure
Future Resident Child — Surface Soil (Exposed Soil Only), Sediment and Surface Water — Mill Pond, and Groundwater — Off-Site Floridan Aquifer
Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report
Baseline Human Health Risk Assessment
Former Thompson Industries Site
Madison, Florida

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Child

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	Exposed Surface Soil						*Inorganics*					
								Aluminum	CNS	2		0.02	2
								Iron	liver	0.4		0.004	0.4
			(Total)	NA	NA	NA	NA	(Total)		2	NA	0.02	2
	Air	Particulates from Exposed Surface Soil						*Inorganics*					
								Iron	NA		—		—
			(Total)	NA	NA	NA	NA	(Total)		NA	0	NA	0
	Air	Vapors from Exposed Surface Soil	(Total)	NA	NA	NA	NA	(Total)		NA	NA	NA	NA
Sediment	Sediment	Sediment Mill Pond	(Total)	NA	NA	NA	NA	(Total)		NA	NA	NA	NA
Surface Water	Surface Water	Surface Water Mill Pond						*SVOCs*					
								bis(2-Ethylhexyl)phthalate	liver	0.003		0.004	0.007
								Inorganics					
								Iron	liver	0.007		0.0004	0.008
								Pesticides					
								beta-BHC	liver/kidney	0.001		0.0007	0.002
			(Total)	NA	NA	NA	NA	(Total)		0.01	NA	0.005	0.02
	Animal Tissue	Fish Tissue from Mill Pond						*SVOCs*					
								bis(2-Ethylhexyl)phthalate	liver	9			9
								Inorganics					
								Iron	liver	3			3
								Pesticides					
								beta-BHC	liver/kidney	0.5			0.5
			(Total)	NA	NA	NA	NA	(Total)		13	NA	NA	13

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Table 6-61
Risk Assessment Summary
Reasonable Maximum Exposure
Future Resident Child — Surface Soil (Exposed Soil Only), Sediment and Surface Water — Mill Pond, and Groundwater — Off-Site Floridan Aquifer
Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report
Baseline Human Health Risk Assessment
Former Thompson Industries Site
Madison, Florida

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Child

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Groundwater	Groundwater Off-Site Floridan Aquifer	(Total)	NA	NA	NA	NA	VOCs: Trichloroethene (Total)	liver/kidney	46 46	NA	— 0	46 46
	Air	Groundwater Water Vapors at Showerhead Off-Site Floridan Aquifer	(Total)	NA	NA	NA	NA	VOCs: Trichloroethene (Total)	NA	NA	0	NA	— 0

Total Risk Across Exposed Surface Soil	NA
Total Risk Across Sediment — Mill Pond	NA
Total Risk Across Surface Water — Mill Pond	NA
Total Risk Across Groundwater — Off-Site Floridan Aquifer	NA
Total Risk Across All Media and All Exposure Routes	NA

Total Hazard Index Across Exposed Surface Soil	2
Total Hazard Index Across Sediment — Mill Pond	NA
Total Hazard Index Across Surface Water — Mill Pond	13
Total Hazard Index Across Groundwater — Off-Site Floridan Aquifer	46
Total Hazard Index Across All Media and All Exposure Routes	62

NA - Not Applicable
CNS - Central Nervous System

Target Organ HI per Medium

Organ	Soil	Sediment	Surface Water	Groundwater
CNS	2	NA	NA	NA
kidney	NA	NA	0.5	46
liver	0.4	NA	13	46

Total CNS HI	2
Total kidney HI	47
Total liver HI	60

5 9 0 2 5 2

Table 6-62
Risk Assessment Summary
Reasonable Maximum Exposure
Future Resident Child — Surface Soil, Sediment and Surface Water — Mill Pond, and Groundwater — Off-Site Floridan Aquifer
Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report
Baseline Human Health Risk Assessment
Former Thompson Industries Site
Madison, Florida

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Child

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	Surface Soil						*Inorganics*					
								Chromium	none	1		0.4	1
								Iron	liver	0.4		0.004	0.4
			(Total)	NA	NA	NA	NA	(Total)		1	NA	0.4	2
	Air	Particulates from Surface Soil						*Inorganics*					
								Iron	NA		—		—
			(Total)	NA	NA	NA	NA	(Total)		NA	0	NA	0
	Air	Vapors from Surface Soil											
			(Total)	NA	NA	NA	NA	(Total)		NA	NA	NA	NA
Sediment	Sediment	Sediment Mill Pond											
			(Total)	NA	NA	NA	NA	(Total)		NA	NA	NA	NA
Surface Water	Surface Water	Surface Water Mill Pond						*SVOCs*					
								bis(2-Ethylhexyl)phthalate	liver	0.003		0.004	0.007
								Inorganics					
								Iron	liver	0.007		0.0004	0.008
								Pesticides					
								beta-BHC	liver/kidney	0.001		0.0007	0.002
			(Total)	NA	NA	NA	NA	(Total)		0.01	NA	0.005	0.02
	Animal Tissue	Surface Water Mill Pond						*SVOCs*					
								bis(2-Ethylhexyl)phthalate	liver	9			9
								Inorganics					
								Iron	liver	3			3
								Pesticides					
								beta-BHC	liver/kidney	0.5			0.5
			(Total)	NA	NA	NA	NA	(Total)		13	NA	NA	13

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Table 6-62
Risk Assessment Summary
Reasonable Maximum Exposure
Future Resident Child — Surface Soil, Sediment and Surface Water — Mill Pond, and Groundwater — Off-Site Floridan Aquifer
Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report
Baseline Human Health Risk Assessment
Former Thompson Industries Site
Madison, Florida

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Child

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Groundwater	Groundwater - Off-Site Floridan Aquifer						*VOCs*					
								Chloroform	liver	0.001		—	0.001
								Trichloroethene	liver/kidney	46		—	46
								Inorganics					
								Chromium	none	0.3		0.03	0.4
			(Total)	NA	NA	NA	NA	(Total)		47	NA	0.03	47
	Air	Groundwater Water Vapors at Showerhead Off-Site Floridan Aquifer						*VOCs*					
								Chloroform	ND		0.1		0.1
								Trichloroethene	NA		—		—
			(Total)	NA	NA	NA	NA	(Total)		NA	0.1	NA	0.1
						Total Risk Across Surface Soil	NA					Total Hazard Index Across Surface Soil	2
						Total Risk Across Sediment — Mill Pond	NA					Total Hazard Index Across Sediment — Mill Pond	NA
						Total Risk Across Surface Water — Mill Pond	NA					Total Hazard Index Across Surface Water — Mill Pond	13
						Total Risk Across Groundwater — Off-Site Floridan Aquifer	NA					Total Hazard Index Across Groundwater — Off-Site Floridan Aquifer	47
						Total Risk Across All Media and All Exposure Routes	NA					Total Hazard Index Across All Media and All Exposure Routes	62

NA - Not Applicable
ND - No Data

Target Organ HI per Medium

Organ	Soil	Sediment	Surface Water	Groundwater	
kidney	NA	NA	0.5	46	Total kidney HI: 47
liver	0.4	NA	13	46	Total liver HI: 60
none/ND	1	NA	NA	0.5	Total none/ND HI: 2

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Table 6-63
Risk Assessment Summary
Reasonable Maximum Exposure
Future Resident Child — Subsurface Soil (Exposed Soil Only), Sediment and Surface Water — Mill Pond, and Groundwater — Off-Site Floridan Aquifer
Appendix J - Combined Expanded Site Investigation/Remedial Investigation Report
Baseline Human Health Risk Assessment
Former Thompson Industries Site
Madison, Florida

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Child

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Subsurface Soil	Subsurface Soil	Exposed Subsurface Soil	(Total)	NA	NA	NA	NA	*Inorganics* Iron (Total)	liver	0.2 0.2	NA	0.002 0.002	0.2 0.2
	Air	Particulates from Exposed Subsurface Soil	(Total)	NA	NA	NA	NA	*Inorganics* Iron (Total)	NA	NA	— 0	NA	— 0
	Air	Vapors from Exposed Subsurface Soil	(Total)	NA	NA	NA	NA	(Total)		NA	NA	NA	NA
Sediment	Sediment	Sediment Mill Pond	(Total)	NA	NA	NA	NA	(Total)		NA	NA	NA	NA
Surface Water	Surface Water	Surface Water Mill Pond	(Total)	NA	NA	NA	NA	*SVOCs* bis(2-Ethylhexyl)phthalate	liver	0.003		0.004	0.007
								Inorganics Iron	liver	0.007		0.0004	0.008
								Pesticides beta-BHC (Total)	liver/kidney	0.001 0.01	NA	0.0007 0.005	0.002 0.02
	Animal Tissue	Fish from Mill Pond	(Total)	NA	NA	NA	NA	*SVOCs* bis(2-Ethylhexyl)phthalate	liver	9			9
								Inorganics Iron	liver	3			3
								Pesticides beta-BHC (Total)	liver/kidney	0.5 13	NA	NA	0.5 13

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Table 6-63
Risk Assessment Summary
Reasonable Maximum Exposure
Future Resident Child — Subsurface Soil (Exposed Soil Only), Sediment and Surface Water — Mill Pond, and Groundwater — Off-Site Floridan Aquifer
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Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Child

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Groundwater	Groundwater - Off-Site Floridan Aquifer						VOCs					
			(Total)	NA	NA	NA	NA	Trichloroethene	liver/kidney	46	—	—	46
								(Total)		46	NA	0	46
	Air	Groundwater Water Vapors at Showerhead Off-Site Floridan Aquifer						VOCs					
			(Total)	NA	NA	NA	NA	Trichloroethene	NA	—	—	—	—
								(Total)		NA	0	NA	0

Total Risk Across Exposed Subsurface Soil	NA	Total Hazard Index Across Exposed Subsurface Soil	0.2
Total Risk Across Sediment — Mill Pond	NA	Total Hazard Index Across Sediment — Mill Pond	NA
Total Risk Across Surface Water — Mill Pond	NA	Total Hazard Index Across Surface Water — Mill Pond	13
Total Risk Across Groundwater — Off-Site Floridan Aquifer	NA	Total Hazard Index Across Groundwater — Off-Site Floridan Aquifer	46
Total Risk Across All Media and All Exposure Routes	NA	Total Hazard Index Across All Media and All Exposure Routes	60

NA - Not Applicable

Target Organ HI per Medium

Organ	Soil	Sediment	Surface Water	Groundwater	
kidney	NA	NA	0.5	46	Total kidney HI: 47
liver	0.2	NA	13	46	Total liver HI: 60

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Table 6-64
Risk Assessment Summary
Reasonable Maximum Exposure
Future Resident Child — Subsurface Soil, Sediment and Surface Water — Mill Pond, and Groundwater — Off-Site Floridan Aquifer
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Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Child

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Subsurface Soil	Subsurface Soil	Subsurface Soil	(Total)	NA	NA	NA	NA	*Inorganics* Iron (Total)	liver	0.3 0.3	NA	0.002 0.002	0.3 0.3
	Air	Particulates from Subsurface Soil	(Total)	NA	NA	NA	NA	*Inorganics* Iron (Total)	NA	NA	— 0	NA	— 0
	Air	Vapors from Subsurface Soil	(Total)	NA	NA	NA	NA	(Total)		NA	NA	NA	NA
Sediment	Sediment	Sediment Mill Pond	(Total)	NA	NA	NA	NA	(Total)		NA	NA	NA	NA
Surface Water	Surface Water	Surface Water Mill Pond	(Total)	NA	NA	NA	NA	*SVOCs* bis(2-Ethylhexyl)phthalate	liver	0.003		0.004	0.007
								Inorganics Iron	liver	0.007		0.0004	0.008
								Pesticides beta-BHC (Total)	liver/kidney	0.001 0.01	NA	0.0007 0.005	0.002 0.02
	Animal Tissue	Fish from Mill Pond	(Total)	NA	NA	NA	NA	*SVOCs* bis(2-Ethylhexyl)phthalate	liver	9			9
								Inorganics Iron	liver	3			3
								Pesticides beta-BHC (Total)	liver/kidney	0.5 13	NA	NA	0.5 13

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Table 6-64
Risk Assessment Summary
Reasonable Maximum Exposure
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Receptor Population:	Resident
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Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Groundwater	Groundwater - Off-Site Floridan Aquifer	(Total)	NA	NA	NA	NA	VOCs Trichloroethene (Total)	liver/kidney	46	—	—	46
										46	NA	0	46
	Air	Groundwater Water Vapors at Showerhead Off-Site Floridan Aquifer	(Total)	NA	NA	NA	NA	VOCs Trichloroethene (Total)	NA	—	—	—	—
										NA	0	NA	0

Total Risk Across Subsurface Soil	NA
Total Risk Across Sediment — Mill Pond	NA
Total Risk Across Surface Water — Mill Pond	NA
Total Risk Across Groundwater — Off-Site Floridan Aquifer	NA
Total Risk Across All Media and All Exposure Routes	NA

Total Hazard Index Across Subsurface Soil	0.3
Total Hazard Index Across Sediment — Mill Pond	NA
Total Hazard Index Across Surface Water — Mill Pond	13
Total Hazard Index Across Groundwater — Off-Site Floridan Aquifer	46
Total Hazard Index Across All Media and All Exposure Routes	60

NA - Not Applicable

Target Organ HI per Medium

Organ	Soil	Sediment	Surface Water	Groundwater
kidney	NA	NA	0.5	46
liver	0.3	NA	13	46

Total kidney HI	47
Total liver HI	60

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