Record of Decision:

Beloit Corporation
IEPA ID: L 2010355004
USEPA: ILD 021440375
Rockton, Illinois

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DECLARATION FOR THE RECORD OF DECISION
BELOIT CORPORATION SUPERFUND SITE
ROCKTON, ILLINOIS

1.1 SITE NAME AND LOCATION

This National Priority List (NPL) site is known as the Beloit Corporation Site, and is located in Rockton, Winnebago County, Illinois.

1.2 STATEMENT OF BASIS AND PURPOSE

This decision document presents the selected remedial action for the Beloit Corporation Superfund site (the Site) in Rockton, Illinois. This remedial action was chosen in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended, the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), and the Illinois Environmental Protection Act. This decision document explains the factual and legal basis for selecting the final remedy for the Site. The decisions contained herein are based on information contained in the Administrative Record for the Site. The United States Environmental Protection Agency (U.S. EPA) concurs with the selected remedy.

1.3 ASSESSMENT OF THE SITE

The response action in this Record of Decision (ROD) is necessary to protect the public health and welfare and the environment from actual or threatened releases of hazardous substances and contaminants from the Site that may present an imminent and substantial endangerment to the public health or welfare.

1.4 DESCRIPTION OF THE SELECTED REMEDY

The selected remedial action contained in this ROD will be a final, site-wide remedy. The remedial action addresses the groundwater and soil contamination at the site. The soil source materials and groundwater constitute the principal threats at the site. The major components of the selected remedy include:

- Continuation of the Interim Source Control Action (ISCA) pump and treat system on Beloit Corporation property.
- Source area groundwater and soil treatment by chemical oxidation.
- Institutional controls to prohibit the installation of potable water wells on Beloit Corporation property until the groundwater is restored to the more stringent of either the

federal maximum contaminant levels (MCLs) or State of Illinois Class I groundwater standards for all contaminants of concern.

- Monitored natural attenuation of groundwater in the Blackhawk Acres subdivision and in the Village of Rockton until the more stringent of either the MCLs or State of Illinois Class I groundwater standards are achieved for all contaminants of concern.

1.5 STATUTORY DETERMINATIONS

Statutory Requirement

The Illinois Environmental Protection Agency (Illinois EPA) (in consultation with the U.S. EPA) is of the opinion that the selected remedy: is protective of human health and the environment; complies with federal and state requirements that are applicable or relevant and appropriate to the remedial action; is cost-effective and utilizes permanent solutions and alternative treatment technologies, to the maximum extent practicable.

Statutory Preference for Treatment

This remedy also satisfies the statutory preference for treatment as a principal element of the remedy (i.e., the remedy reduces the toxicity, mobility, or volume of hazardous substances, pollutants, or contaminants as a principal element through treatment).

Five-Year Review

This remedy will not result in hazardous substances, pollutants, or contaminants remaining on the site above levels that allow for unlimited use and unrestricted exposure. However, it will take more than five years to attain remedial action objectives and cleanup levels. Therefore, a policy review will be conducted within five years of construction completion at the site to ensure that the remedy is, and will be, protective of human health and the environment.

1.6 ROD DATA CERTIFICATION CHECKLIST

The following information is included in the Decision Summary section of this Record of Decision. Additional information can be found in the Administrative Record for this site.

- Chemicals of concern and their respective concentrations (Section 2.5).
- Baseline risk represented by the chemicals of concern (Section 2.7).
- Cleanup levels established for chemicals of concern and the basis for these levels (Section 2)
- How source materials constituting principal threats are addressed (Section 2.11).

- Current and reasonable anticipated future land use assumptions and current and potential future beneficial uses of groundwater used in the baseline risk assessment and the ROD (Section 2.12).

- Potential land and groundwater use that will be available at the site as a result of the selected remedy (Section 2.12).

- 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 (Section 2.12).

- Key factor(s) that led to selecting the remedy (Section 2.12).

1.7 AUTHORIZING SIGNATURES

SEP 21 2004

Renee Cipriano, Director
Illinois Environmental Protection Agency

Date

Sept 27, 2004

Richard C. Karl, ~~Acting~~ Director
Superfund Division
United States Environmental Protection Agency

Date

DECISION SUMMARY
BELOIT CORPORATION SITE
ROCKTON, ILLINOIS

2.1 SITE NAME, LOCATION, AND DESCRIPTION

Site Name and Location

The Beloit Corporation, Rockton Facility is located in Rockton Township, in north-central Illinois. The NPL Site occupies part of the northern half of Section 13 and the southeast quadrant of Section 12, T46N, R1E, Winnebago County, Illinois.

The NPL Site, as defined by Consent Decree, is bounded on the north by Prairie Hill Road, on the west by the Rock River, on the south by a line projected from the Rock River along the south edge of a Village of Rockton easement and access road (for the village water tower) to Blackhawk Boulevard, and on the east by Blackhawk Boulevard. The NPL site area includes the Beloit Corporation property, the neighboring Blackhawk Acres subdivision, the former Soterion/United Recovery facility (Soterion), a portion of the Taylor, Inc. property and the Safe-T-Way property (see Figure 1).

CERCLIS ID Number

The EPA Identification Project Number for this NPL site is ILD021440375. The Illinois EPA Identification Number for this site is L2010355004.

Lead and Support Agencies

The Illinois EPA is the lead agency and the U.S. EPA is the support agency for this site.

Site Type

The NPL site includes a mixed industrial and residential area. The manufacturing facility formerly owned by the Beloit Corporation comprises the majority of the site.

Site Description

The area of the NPL site, as defined by the Illinois EPA and the U.S. EPA, consists of the Beloit Corporation property, the Blackhawk Acres subdivision and several industries adjacent to the Blackhawk Acres subdivision, including the former Soterion/United Recovery facility, a portion of Taylor, Inc. property and Safe-T-Way. The Beloit Corporation is a former manufacturer of machines that produced layered paper products from paper pulp.

In the early 1980s, the Illinois EPA investigated United Recovery, an industrial waste processing plant that was operating at the Soterion facility. A groundwater quality study of private water supply wells located in the Blackhawk subdivision was also conducted. The discovery of volatile organic compounds (VOCs) [primarily tetrachloroethene (PCE) and 1,1,1-Trichloroethane (1,1,1-TCA)], in residential groundwater led to subsequent groundwater quality studies and the inclusion of the site on the NPL. Pursuant to a consent decree entered into between Beloit Corporation and the State in federal court on October 17, 1991, Case 91 C 20137, Beloit Corporation was required to complete a remedial investigation and feasibility Study (RI/FS) for the Beloit Corporation facility, which included the Beloit Corporation property. Beloit Corporation performed a complete RI and FS with oversight by the Illinois EPA. Based on the RI, the Illinois EPA believes that the VOC contamination of groundwater originates on Beloit Corporation property and extends into the Village of Rockton and the southern portion of the Blackhawk Acres subdivision. The use of solvents for machine parts cleaning at the Beloit Corporation plant was identified as the source of the groundwater contamination. A second trichloroethene (TCE) plume located deeper within the shallow aquifer, originates near the southeast corner of the Beloit Corporation property and extends into the Village of Rockton. The source of this TCE plume could not be identified.

In 1993, the Illinois EPA installed point-of-entry carbon filtration units in residences with impacted wells in the Blackhawk Acres subdivision. An Interim Source Control Action (ISCA) pump and treat system has was also installed in 1996 on Beloit property to begin treatment of the On-Property Plume and to prevent further off-property migration of VOCs. Monitoring data indicates that the Village of Rockton municipal water supply has not been, and should not be, affected by the site contamination. The VOC plumes in the Village of Rockton and the Blackhawk Acres subdivision have been naturally attenuating since the ISCA pump and treat system was implemented.

2.2 SITE HISTORY

History of Site Industrial Activities

The Beloit Corporation property was farmland prior to 1957 when it was purchased by the Beloit Corporation. Various parts of the facility have been constructed in numerous stages since that time. The Beloit Corporation was a manufacturer of machines that produced layered paper products from paper pulp. Solvents were used at the Beloit Corporation plant for parts cleaning operations. Non-chlorinated solvents were used until the mid 1970s and chlorinated solvents were used from the mid 1970s until 1983. The exact composition of the chlorinated solvents and the amounts used are unknown. From 1983 until the facility was closed in 1999, mineral spirits were used for metal degreasing and parts cleaning.

In June 1999, the Beloit Corporation filed for bankruptcy. In July 2001, the Beloit Liquidating Trust became the owner of all the remaining liabilities and assets of the Beloit Corporation, including the Rockton property. In February 2002, U.S.EPA, the United States Department of Justice (DOJ) and Guiffre II, LLC, the new owner of the property located within the Beloit Corporation site, signed a settlement agreement under Section 122(h) of

CERCLA. The State was also a party to and signed that agreement in April 2002. The Section 122(h) agreement was to settle and resolve the potential liability of the new owner resulting from its ownership and/or operation of the property, and to facilitate cleanup of the contamination at the NPL site.

The former Soterion facility is located at the southern limits of the Blackhawk Acres subdivision. This site consisted of four Quonset huts where waste cuttings from metal fabricating operations were processed before being recycled. Complaints of poor waste-handling practices at the facility and the detection of elevated VOC levels in many homes located on Watts Avenue near the Soterion facility prompted the Illinois EPA to conduct investigations from 1980 to 1982. During these investigations, the Illinois EPA documented releases of waste oils by Soterion to the ground, through the septic system and into a dry well located in front of the Soterion building at 900 Watts Avenue.

Safe-T-Way is a small manufacturing facility located on the cul-de-sac of Blackhawk Boulevard, in the southeastern area of the Blackhawk Acres subdivision. Safe-T-Way manufactures small explosion-proof containers for gasoline and other flammable liquids.

Taylor, Inc. is a large, refrigeration components manufacturing facility located south of the Blackhawk Acres subdivision. Only the northern portion of Taylor, Inc. is located within the NPL site.

History of Investigations

The Illinois EPA and the Beloit Corporation have conducted numerous investigations, both within and outside the boundaries of the site. On August 30, 1990, the Beloit Corporation facility was listed on the NPL. The Beloit Corporation entered into a Consent Decree with the Illinois EPA on October 17, 1991 to conduct a RI/FS for the NPL site. Four phases of investigation for the RI were conducted between July 1992 and January 1998. The four phases focused on the objectives of:

- Assessing the nature and extent of contamination on the Beloit property, in the Blackhawk Acres subdivision and in the Village of Rockton;
- Identifying source areas;
- Providing information for assessing the risks, both human and ecological, posed by the contamination; and,
- Providing information for the evaluation of remedial alternatives (i.e., completing the FS).

The four phases of investigations for the RI are documented in the Technical Memorandum Reports 1 through 4, that are part of the Administrative Record for the site.

A Baseline Risk Assessment (BLRA) was conducted to determine if the site potentially poses unacceptable levels of risk to human health and the environment. The BLRA was conducted by the Beloit Corporation with oversight by the Illinois EPA in accordance with Subpart E, Section 300.430(d) of the revised NCP as promulgated on March 8, 1990. The Illinois EPA conditionally approved the BLRA in December 2000 and Beloit Corporation submitted the final BLRA, with requested revisions, in January 2001.

In November 2001, the final FS that discusses and compares the potential cleanup remedial alternatives was completed by the Beloit Corporation. The Illinois EPA conditionally approved the final FS in January 2002.

2.3 COMMUNITY PARTICIPATION

The Illinois EPA established a community relations program for the Beloit Corporation site prior to its being listed on the NPL. Representatives from the Office of Community Relations have been actively involved with the Village of Rockton and other area communities since the initial environmental investigation in 1986. Since 1986, the Illinois EPA has conducted a variety of public involvement activities that promote and maintain two-way communications between the Illinois EPA and the community, specifically the stakeholders, local officials, residents, media and the responsible party (Beloit Corporation).

Highlights of Illinois EPA's Community Relations Program.

Federal regulations require community relations activities that are consistent with CERCLA during remedial activities at Superfund sites. These requirements provide the basis for a comprehensive, responsive and effective community relations program. As in most Superfund sites, the stakeholders at this site include the property owners, residents, local officials and the media.

For the past several years, a variety of community-relations functions and activities have been used at the Beloit Corporation Superfund site. These functions and activities include:

- Contact Person. An Illinois EPA spokesperson from the Office of Community Relations has been assigned to the Beloit Corporation Superfund site since 1990. This person assumes the responsibility of addressing citizens' concerns, answering their questions and responding to media inquiries.

- Community Interviews. At the beginning of the RI/FS, the Illinois EPA conducted informal interviews with affected residents and community leaders to ascertain levels of interest in the site, major concerns and issues and information needs. Individuals who had previously worked at the Beloit Corporation also provided valuable site background information. The information gathered during these interviews helped the Illinois EPA to tailor the community relations program to the needs of the community of Rockton and the nearby area.

- Community Relations Plan. Based on the community interviews, the Office of Community Relations prepared a plan that included a site description, community background information, highlights of the community relations program, the history of community involvement at the site, community relations strategies, a schedule of community relations activities and a list of contacts, local officials and interested parties.

- Information Repository and Administrative Record. Prior to the RI, the Illinois EPA established an information repository at The Talcott Free Library, 101 East Main Street, Rockton, Illinois. Technical and reference documents are made available for public access and review at this location. The information repository is updated periodically, as additional documents are made available. The establishment of an administrative record for the selection of a response action is also required. The administrative record must include the documents the Illinois EPA relied on when selecting the response action. A public notice of the availability of the administrative record for the response action was published in the local newspaper (*The Rockton Herald*). The administrative record is also housed in The Talcott Free Library.

- Technical Assistance Grants Notification. An Illinois EPA fact sheet informed the community of the availability of technical assistance grants prior to the RI.

- Meetings and Availability Sessions. Since the 1980s, the Illinois EPA has held a series of public and informational meetings and availability sessions at The Talcott Free Library and the Hononegah High School. Technical presentations and one-on-one discussions have been an integral part of the public participation program for the Beloit Corporation Superfund site. These public forums have allowed the citizens, local officials and members of the media to ask questions and express their concerns directly to Illinois EPA community relations and technical staff. All meetings and availability sessions were announced in a local newspaper and an Illinois EPA fact sheet prior to the meeting dates.

- Fact Sheets. Four Illinois EPA fact sheets have been developed and distributed. These fact sheets were made available to provide information to the public on residential well sampling, environmental investigation updates, public meeting announcements, proposed plan development, additions to the Information Repository, commencement and completion of response actions, schedule delays and the establishment of the Administrative Record.

- News releases. Official statements related to several milestones achieved in the response program were released to the news media and, included the filing of the consent decree, the beginning and completion of the RI and the implementing of a source control removal action.

- Telephone Contacts. Telephone calls to local officials and concerned citizens were a common community-relations activity. These phone calls addressed needs such as information requests, resident concerns and private water well sampling results.

- Living Room or Small Group Meetings. During the early stages of the RI, Illinois EPA community relations and technical staff met with property owners in private homes to discuss residential well sampling on a one-on-one basis.

- Mailing/Contact List. The Illinois EPA has compiled a list of names, addresses and phone numbers of appropriate federal, state and local officials, media contacts and other interested community members. This list is frequently updated and revised. (The names of residents and property owners remain confidential.)

- Residential Well Sampling Letters. The Illinois EPA has been collecting private water well samples from homes and businesses in and around the Blackhawk Acres Subdivision since 1982. Written permission had to be obtained from property owners prior to quarterly and annual residential well sampling. After each sampling event, the Illinois EPA and the Illinois Department of Public Health sent follow-up letters that explained laboratory analyses results and health risks to property owners.

- Private Water Well Surveys. To ensure that the Beloit Corporation Superfund site mailing list is up to date, private water well sampling is complete and property access is obtained, the Illinois EPA occasionally mails a private water well survey to the home and business owners in the area of concern. Once completed, the survey is returned to the Illinois EPA in a self-addressed envelope, and pertinent records are updated.

- Village and Township Board Updates. Illinois EPA technical and community relations staff periodically discuss milestone events with the Mayor and Village and Township Board Members.

Proposed Plan Notification, Public Hearing and Public Comment Period. The completion of the RI/FS and proposed plan requires extensive community-relations efforts. The community must be informed by the Illinois EPA about the proposed plan and have an opportunity to make comments. Specific community relations activities are required by CERCLA during this time. The Illinois EPA completed the following required activities for the Beloit Corporation Superfund site:

- Developed a proposed plan. The proposed plan was prepared for public comment. The plan summarized the remedial alternatives that were presented in the detailed analysis of the RI/FS, identified the preferred alternative, provided the rationale for the preferred alternative and identified proposed waivers to cleanup standards.

- Published a notice of availability of the proposed plan and RI/FS. The availability of the proposed plan, the RI/FS, a summary of the proposed plan and information about the public comment period was announced in a local newspaper. A fact sheet containing similar information was also sent to homes and businesses in the Blackhawk Acres Subdivision and the surrounding area.

- Made the proposed plan and supporting analysis and information available in the administrative record. The administrative record is located in The Talcott Free Library, *101 East Main Street, Rockton, Illinois.*

- Provide public comment period. A 30-day public comment period was provided to allow the public the opportunity to submit oral and written comments. The public hearing was held during this public comment period.

- Conduct a public hearing. As required by Illinois Statute, a public hearing was held during the public comment period. Oral comments were recorded by a court recorder who was provided to ensure that a written transcript of the meeting was made available to the public. The transcript was placed in the information repository and administrative record.

- Responsiveness Summary. The Illinois EPA prepared a responsiveness summary that summarized the significant public comments (both oral and written) and the agency's response to those comments. The responsiveness summary was provided to those requesting a copy. This document becomes a part of the ROD.

- Announcement of final ROD. The Illinois EPA announced in a local newspaper that the ROD was signed and the final remedy action plan was selected. It is required that this announcement be made before any remedial action takes place.

- Revision of Community Relations Plan. Prior to the remedial design, the Community Relations Plan will be revised. The Illinois EPA will conduct community interviews and will mail a questionnaire to local home and business owners to determine the concerns and interests of the community as related to the Beloit Corporation Superfund site. Responses to this questionnaire will be used to revise and supplement any on-going community relations activities.

2.4 SCOPE AND ROLE OF RESPONSE ACTIONS

The remedial action contained in the ROD will be a final site-wide remedy. Some response actions consistent with the remedy have already been implemented at the site. These actions include the provision of water treatment systems to residents with VOCs above MCL or Illinois Class I Groundwater Standards in their drinking water and the initiation of containment and cleanup of the VOC-contaminated groundwater plume originating on the Beloit property.

In 1993, the Illinois EPA installed point-of-entry carbon filtration systems on four residential water supplies with VOCs in excess of MCLs and Illinois Class I groundwater standards. These units were placed at 910, 914, and 918 Watts Avenue and at 1102 Blackhawk Avenue in the Blackhawk Acres subdivision. The Illinois EPA maintains and monitors these systems.

In April 1996, the Illinois EPA issued an Action Memorandum for the Beloit Corporation to implement an Interim Source Control Action (ISCA) on the Beloit Corporation property. An

Engineering Evaluation/Cost Analysis (EE/CA) prepared by the Beloit Corporation recommended a groundwater pump and treatment system to contain and clean up the VOC plume found on their property. The Illinois EPA approved the implementation of this interim remedial action. The system consists of four extraction wells and an air-stripping tower located in the southeastern corner of the Beloit Corporation property. The system is designed to contain groundwater within the Beloit Corporation property and provide treatment of extracted groundwater by air stripping. Treated groundwater is discharged to the Rock River under a National Pollutant Discharge Elimination System (NPDES) permit, at an outfall located on Beloit property. The air discharge from this system has been shown to be minimal and substantially less than the regulatory limit of 8 lbs. per day. This rate does not require an air permit and does not represent a significant source of VOCs to the atmosphere. The ISCA pump and treatment system went on-line on July 2, 1996, as documented in the Removal Action Design Report (Montgomery Watson, 1996). This system has been in continuous operation since that time.

In 1998, VOC-impacted water was also found in a private water supply well located at 630 N. Blackhawk Drive in the Village of Rockton. This residence was connected to the Village of Rockton municipal water supply in 1999.

2.5 SITE CHARACTERISTICS

Conceptual Site Model

The organic and inorganic contaminants identified at the site during the RI have several potential pathways through which people may be exposed, if no further remedial action would occur. The sources of contamination, affected media, routes of potential exposure and possible human receptors are described below and shown in Table 2-1. The following pathways were selected for detailed evaluation under current land use conditions:

- Residential groundwater use from a private well from within the northern portion of the Blackhawk Acres subdivision.
- Residential groundwater use from a private well from within the other portions of the Blackhawk Acres subdivision.
- Incidental ingestion and dermal absorption of chemicals from surface water by children swimming in the Rock River in the groundwater discharge zone located south of the Village of Rockton (off the NPL site).
- Incidental ingestion and dermal contact with sediment by children trespassing and playing along the banks of the Rock River adjacent to the Beloit Corporation property.
- Incidental ingestion and dermal contact with surface soil by children trespassing on the Beloit Corporation property.

- Incidental ingestion, inhalation and dermal contact with surface soils and inhalation of fugitive vapors by employees on Beloit Corporation property working in areas of exposed soils.

- Incidental ingestion, inhalation and dermal contact with surface and subsurface soils and inhalation of fugitive vapors by construction workers digging in soils on the Beloit Corporation property.

Under future land use conditions, the following hypothetical pathways were selected for evaluation:

- Use of groundwater from a private well south of the Beloit Corporation property.

- Use of groundwater from a private well within the southern Blackhawk Acres subdivision.

- Use of groundwater from a private well within the eastern Blackhawk Acres subdivision.

- Exposure to soils with chemicals of potential concern (COPC) by Beloit Corporation or other future site employees working in areas of exposed soils.

- Exposure to soils with COPC by construction workers digging in soils on the Beloit Corporation property.

Other potential pathways shown on Table 2-1 were judged incomplete or insignificant from a public health standpoint, based on very low concentrations of detected contaminants or limited opportunities for chemical exposure. However for completeness, these pathways were qualitatively evaluated in the BLRA. The migration of vapors from groundwater COPCs into residential dwellings (vapor intrusion pathway) was not included in the quantitative assessment based on screening results which indicated that risks associated with the vapor intrusion pathway did not significantly contribute to the cumulative estimated risks posed by the COPCs (see Section 2.6 for a discussion of the vapor intrusion screening).

In the ecological screening assessment, exposure pathways were assessed on the basis of current site conditions. Under future site conditions, the potential for ecological receptor exposure was not anticipated to change (i.e., become greater), compared to current site conditions. The receptors of primary concern were those that would have direct contact with sediment of the Rock River or surface soil on Beloit property. While a variety of wetland or upland dependent receptors could have been selected, for purposes of the screening level assessment only general classes of receptors were selected. For the wetlands habitat, sediment associated biota such as amphibians, invertebrates and wetland plants were selected. For the terrestrial habitats, threatened or endangered plants and soil-associated invertebrates such as earthworms were selected as the receptors of concern. The potential for general bioaccumulation to higher trophic levels was also considered.

Overview of the Site

The Beloit Corporation Rockton Facility is located in Rockton Township, in north-central Illinois. The NPL site lies in a mixed industrial and residential area adjacent to and within the Village of Rockton. The NPL site occupies part of the northern half of Section 13 and the southeast quadrant of Section 12, T46N, R1E, Winnebago County, Illinois. The NPL site area includes Beloit Corporation property, the neighboring Blackhawk Acres subdivision, the former Soterion/United Recovery facility (Soterion), a portion of the Taylor, Inc. property, and the Safe-T-Way property.

In general, the site has very little relief. The area is the Rock River/Pecatonica River alluvial valley. Surface elevations in this area range from approximately 900 feet above mean sea level (MSL) at the top of the rolling uplands to less than 720 feet above MSL, where the Beloit Corporation property meets the southerly flowing Rock River.

Sand/gravel mining, building/road construction and various disposal areas have altered the NPL site area. Disposal of foundry sand at the facility created a mound, approximately 11 feet high, southwest of the Beloit Corporation property. The ground surface slopes gently from the gravel pit area located east of the Beloit Corporation Research Center (BCRC) toward the village to the south and toward the Rock River to the southwest and west. In the areas where site surface soils have been removed (gravel pit, site building footprints, paved areas and storage yards), the exposed materials are mostly well-drained silty sands and gravels.

The NPL site is bounded to the west by the Rock River. The bottomland (wetland) areas, which compose the floodplain of the Rock River, located on the west side of the Beloit Corporation property, are considered a jurisdictional wetland. The surface water drainage on the Beloit Corporation property flows generally towards the Rock River and along a railroad corridor.

Site Features

The Beloit Corporation Research Center (BCRC), used for the design and demonstration of papermaking machines, is located in the northwest portion of the property (see Figure 2). Two wastewater treatment ponds and two clarifier tanks are located west of the BCRC. The Beloit Corporation manufacturing plant (BCP), including the Erection Bay (where machines were assembled prior to shipping), is located south of the BCRC.

Large outdoor storage yard areas (SYA), which held scrap metal, pipe and miscellaneous equipment, are located on the north and south sides of the BCP. These areas are paved with asphalt or covered with crushed stone.

A former foundry sand disposal area (FSDA) and a former fibrous sludge spreading area (FSSA) are located southwest and further south of the BCP. The Beloit Foundry, a sister company of the Beloit Corporation, used the FSDA for disposal in 1977. In 1989, the Beloit

Corporation also used this area for disposal of soil generated during the construction of the Erection Bay addition to the BCP. An inactive gravel pit is located east-northeast of the BCRC.

Other features of the NPL site include the Soterion facility, which is located at the southern limit of the Blackhawk Acres subdivision. This site consisted of four Quonset huts where waste cuttings from metal fabricating operations were processed before being recycled.

Safe-T-Way is a small manufacturing facility located on the cul-de-sac of Blackhawk Blvd., in the southeastern area of Blackhawk Acres subdivision. Safe-T-Way manufactures small explosion-proof containers for gasoline and other flammable liquids.

Taylor, Inc. is a large manufacturing facility located south of the Blackhawk Acres subdivision. Only the northern portion of Taylor, Inc. is located within the NPL site, as defined by the U.S. EPA and the Illinois EPA. Taylor, Inc. manufactures refrigeration units for commercial applications.

Additional structures identified within the site boundary are the homes and roadways that make-up the subdivision and buildings and paved areas at Taylor, Inc., Safe-T-Way and Soterion.

Site Sampling Strategy

The RI was conducted in a phased approach where data collected during each phase of investigation were evaluated and subsequent investigation activities were then based on the previous results. The activities conducted during the four phases of investigation were completed in accordance with methods outlined in planning documents approved by the Illinois EPA.

The objectives of the RI Phase I and II Investigations were to identify and investigate the source area(s) of VOCs identified at the NPL Site. The objective of the Phase III Investigation was to determine the extent of migration of VOCs in groundwater. The objectives of Phase IV were to evaluate potential sources of a deep TCE plume identified in wells located in the southern portion of Beloit property, in southern Blackhawk Acres subdivision and in the Village of Rockton; to identify if VOCs detected at 1102 Blackhawk Boulevard were migrating from an upgradient source area; and to determine what effect the ISCA pump and treat system was having on groundwater in the southern portion of the Blackhawk Acres Subdivision.

The following areas were investigated:

- Foundry Sand Disposal Area (FSDA)
- Fibered Sludge Spreading Area (FSSA)
- Storage Yard Area (SYA)
- Beloit Corporation Plant (BCP)
  - Erection Bay

  - Chip Pad
  - Former Dry Well
  - Weldery
  - Former Loading Dock
  - Paint Room
- Former Wastewater Treatment Lagoons (Lagoons)
- Gravel Pit
- Blackhawk Acres Subdivision
- Rock River and the wetlands west of Beloit
- Rockton Excavating
- Village of Rockton
- Soterion

The following types of investigative activities were conducted in these areas:

Water Supply Well Survey. The homes in the Blackhawk Acres subdivision use private wells for their water supply, while the Village residents use the municipal water supply that was installed in 1955. The Village has three water wells to supply the municipal water distribution system. This system supplies water to the majority of the Village (except for new portions of the village to the east of the Site and a limited number of homes with private wells within the village).

The Beloit Corporation determined that there were private wells within the Village. There are ten private wells in the central portion of the Village that are currently monitored by the Illinois EPA. Other private wells within the Village limits are located east of Highway 2 or west of Grove Street.

Meteorological Investigation. During the RI, only rainfall and barometric pressure readings were taken at the site during the ISCA pump and treat system evaluation. Information from a literature review was collected concerning the general meteorological conditions in the vicinity of the site.

Surface Water and Sediment Investigations. Rock River stages were measured periodically throughout the RI, along with groundwater levels, to determine the effects of the river on the shallow aquifer. A field reconnaissance was conducted over the site on August 17,1992, to identify general surface water runoff drainage patterns.

During Phases I and II, staff gauges were installed at multiple locations along the edge of the site in the Rock River to evaluate and delineate potential migration pathways towards the wetlands and Rock River.

During Phase IV, one staff gauge was installed in the hydroelectric plant raceway to the west of the Village to evaluate the effect of the raceway on the groundwater system. One additional staff gauge was installed in the Rock River to the south of the Village. Staff gauge elevations are resurveyed annually (in the spring following melting of the ice).

Geologic Investigations. Geologic investigations conducted at the site included geotechnical borings, soil borings, surface and borehole geophysics and groundwater quality borings. Numerous soil samples collected during the RI were submitted to a geotechnical laboratory for grain size analysis. The data collected by these investigations were used to complete boring logs and interpret the geology of the site.

Soil and Vadose Zone Investigations. During Phase I and Phase II, soil gas investigations in the vadose zone were completed to identify potential source areas. Soil borings and groundwater quality borings (conducted during all phases of investigation) generated data that were also used to characterize the chemical and physical nature of surficial soils and soils within the vadose zone.

Samples collected from soil borings during Phase I were screened using a field headspace screening method and a photoionization detector (PID) to determine which samples would be submitted to the laboratory for analysis. During Phase II, samples were collected at five-foot intervals and were screened with a field laboratory gas chromatograph (GC). Results of the field GC screening were used to identify VOCs and potential source areas that required further investigation and to determine which samples would be submitted to the laboratory for analysis. Soils were described according to the Unified Soil Classification System (USCS), using either grain size analyses or visual classification.

During Phase I and Phase II, surface soil samples were collected on the Beloit property in the SYA, FSSA and FSDA and at background locations outside of the Site. The surface soil sampling was conducted primarily in support of the BLRA.

Groundwater Investigations. During the RI, groundwater investigations were conducted and included a combination of: soil borings with groundwater samples collected at the water table; hydraulic probe borings with groundwater samples collected at the water table; and groundwater quality borings with groundwater profile samples collected from the water table to the total boring depth. The groundwater samples were analyzed using a field GC to guide each investigation as it proceeded. Groundwater sampling from shallow, intermediate and deep monitoring wells was also conducted during each phase of investigation.

During Phase I, groundwater quality borings were conducted on the Beloit property, in the Blackhawk Acres subdivision and at Rockton Excavating. Groundwater samples were screened, using the field GC, and the results were used to determine monitoring well screen placement. Round 1 groundwater sampling was completed following installation of all wells. Private wells in the subdivision were also sampled. The results of the Phase I groundwater investigation were used to determine investigative locations for Phase II.

During Phase II, soil gas samples were collected and screened, using a field GC. Based on the results from the soil gas investigation, soil borings were conducted to further evaluate or eliminate potential source areas. Soil borings were drilled to the water table and soil samples and a groundwater sample were collected and screened. Based on the results of the screening of both soil and groundwater, additional borings were conducted to further evaluate or

eliminate potential source areas. Following the completion of the soil boring investigation, groundwater quality borings were conducted to determine the extent of VOC distribution in the groundwater. Groundwater samples were screened and the results were used to determine monitoring well screen placement. Data was also collected on the historic use of the Beloit Corporation production well W441E. Round 2 groundwater sampling was completed following the installation of new monitoring wells. The Illinois EPA conducted private well sampling in the Blackhawk Acres subdivision. Results from the Phase II groundwater investigation activities were used to identify migration pathways and to determine subsequent locations for additional borings and monitoring wells during Phase III.

During Phase III, hydraulic probes and a groundwater quality boring were conducted in the wetlands (located to the west of the Erection Bay) to determine if VOCs were migrating from the Erection Bay area toward the wetlands and the Rock River. Groundwater quality borings were also completed in the Blackhawk Acres subdivision and south of the Site to determine the horizontal and vertical extent of VOCs in the groundwater. Groundwater samples were screened and the results were used to determine monitoring well screen placement and downgradient locations for additional monitoring wells. Groundwater sampling rounds 3 and 4 were completed following installation of additional monitoring wells.

During Phase IV, soil borings and groundwater quality borings were conducted in the vicinity of Soterion to determine if a source of the deep TCE plume existed. One soil boring was conducted upgradient of 1102 Blackhawk Boulevard to determine if VOCs detected in the private well were migrating from an upgradient source. One groundwater quality boring was conducted in the central portion of the Beloit Corporation property to determine if geologic anomalies could have allowed vertical migration of the TCE plume from a source on Beloit property. A fifth round of groundwater sampling was completed, following installation of additional monitoring wells. An evaluation was completed to determine if the ISCA pump and treat system was having an effect on groundwater flow in the southern portion of the Blackhawk Acres subdivision. Quarterly groundwater sampling is currently conducted on selected monitoring wells, in accordance with ISCA operations requirements.

Types of Contamination and Affected Media

Monitoring Well Results. During many groundwater sampling events, VOCs were detected in several monitoring wells. The primary VOCs detected in the groundwater were halogenated alkenes (PCE and TCE) and halogenated alkanes [1,1,l-TCA, 1,1-dichloroethane (l,1-DCA)]. During the first round of sampling, groundwater samples were also analyzed for semi-volatile organic compounds (SVOCs), pesticides, polychlorinated biphenyls (PCBs) and dissolved metals.

During the subsequent sampling rounds, groundwater samples were analyzed for SVOCs, pesticides, PCBs and metals only if they were detected during the first sampling round. During Phase 1, only four SVOCs were detected in one or two wells at low concentrations of 1 or 2 micrograms per liter (µg/L). No PCBs were detected in the monitoring wells, and only two pesticides were detected at trace concentrations (i.e., less than 1 µg/L). None of the Phase

I detected SVOCs or pesticides were detected during the second sampling phase. Thereafter, SVOCs and pesticides were not considered chemical groups of potential concern in groundwater at the Site, because they were not detected in subsequent sampling rounds and no sources of these compounds were shown to exist.

During the Phase 1 investigation, a number of metals were detected in groundwater. However, all the detected metals were at concentrations below their Federal Drinking Water Standards (i.e., MCLs) with the exception of cadmium and zinc. During Phase 1, these two metals were detected at or above their respective MCL in a single shallow and intermediate monitoring well. During the second phase of sampling, concentrations of these metals were detected at concentrations below their MCLs. For this reason, metals were not considered a chemical group of concern.

Based on the monitoring well results, VOCs were the only chemical group of potential concern identified for groundwater at the Site.

Private Well Results. Groundwater samples collected from private wells were analyzed for VOCs and SVOCs during the first round of sampling. VOCs were detected in several of the private wells. However, only a single SVOC (1,4-dichlorobenzene) was detected at a very low concentration (0.6 µg/L). No other SVOC was detected in the groundwater collected from the private wells. For this reason, VOCs were considered the only chemical group of potential concern in the private wells.

River Sediment Results. Sediment samples were collected from the Rock River during the Phase III investigation. The sediment samples were collected to determine if there were impacts to the Rock River associated with the Beloit Corporation property. The sediment samples were collected at ten locations along the reach of the Rock River that is adjacent to the NPL site.

The sediment samples were analyzed for U.S. EPA Target Compound List (TCL) organics and Target Analyte List (TAL) inorganics. Four VOCs were detected in one or more samples at concentrations less than 0.2 milligram per kilogram (mg/kg). SVOCs were also sporadically detected in the sediment samples at four of the ten sediment sample locations. The SVOCs were primarily polycyclic aromatic hydrocarbons (PAHs). The concentrations of PAHs in the sediment were less than 1 mg/kg, except at sediment sample location SDO7, where concentrations of individual PAHs were as high as 100 mg/kg. The elevated PAH concentrations at SDO7 appear to be an isolated occurrence unrelated to activities on the NPL site.

A number of metals were also detected in the sediment samples collected from the Rock River. The sediment metal concentrations downstream of the NPL site were generally higher than the concentration of metals samples upstream of the site. The analytes detected in the river sediments were retained as COPC and their risks were assessed, regardless of whether or not these metals were associated with the NPL site.

River Surface Water Results. During the Phase III investigation, a single surface water sample was collected from the Rock River adjacent to the Beloit Corporation property. This sample was taken to verify that organic chemicals in the groundwater were not being discharged to the Rock River adjacent to the Beloit Corporation property. No organic compounds were detected. Because the discharge of groundwater to the river is limited to the far northern portion of the Beloit property where no organic chemicals were detected in groundwater and surficial runoff is not considered a pathway, this one sample was considered sufficient to demonstrate that organic chemical impacts have not occurred to the Rock River in this area.

It should be noted that groundwater also discharges to the Rock River south of the Site and south of the Village of Rockton. For this reason, the VOCs that were detected in the groundwater monitoring wells downgradient of the NPL site (in the Village of Rockton) were retained as COPC in the surface water in this reach of the Rock River.

Surface and Subsurface Soil Results. Soil samples were collected from the vadose zone during the RI at depths varying from 0.5 feet (surface soil) to the depth of the water table at the time of the sample collection. Samples were collected at the FSDA, FSSA, SYA, BCP, Waste Water Treatment Ponds and the Gravel Pit on Beloit property, and at Rockton Excavating and Soterion, off the Beloit property.

A number of SVOCs were detected in selected soil samples. The majority of the detected SVOCs were PAHs, at concentrations less than 130 mg/kg. Low concentrations (i.e., less than 0.36 mg/kg) of PCBs were detected on the Beloit Corporation property, as were low concentrations (i.e., less than 0.15 mg/kg) of organopesticides. As expected, a number of metals were detected in soils on the NPL site. These compounds were retained as COPC and their risks were assessed in the BLRA.

The VOCs detected in soils are primarily limited to PCE at the Erection Bay of the BCP. The highest concentrations of PCE detected in the soil occur directly above the zone of the highest PCE in groundwater (i.e., at monitoring well W23). PCE concentrations in vadose zone soil from the Erection Bay included detections of 76 µg/kg at 17 feet below ground surface (bgs) and 170 µg/kg at 13 feet bgs. The highest concentration of PCE was 433 µg/kg, found below the water table near monitoring well W23. The only other VOCs detected in subsurface soil samples are 1,2-dichloroethene (1,2-DCE) at 4 µg/kg (below the Erection Bay at 24 feet bgs.), xylenes at 250 µg/kg (in the scrap metal storage area at 3 feet bgs) and ethylbenzene at 8 µg/kg (in the scrap metal storage area at 3 feet bgs).

Very low (less than 15 µg/kg) or no concentrations of VOCs were detected in other areas of potential concern, including the FSDA, FSSA, SYA, Waste Water Treatment Ponds, Gravel Pit, Rockton Excavating, or Soterion, based on the analysis of 162 surface and subsurface soil samples and 192 soil gas samples.

NORM Results. The Illinois EPA requested a survey of naturally occurring radioactive material (NORM) be conducted over the FSDA. The survey results indicate that

concentrations of NORM above background were not detected in this area of the site, and in general, NORM readings were less than background soil readings. Based on these results, NORM is not considered a COPC for this site.

Extent of Contaminants and Source Areas

Based on the RI and BLRA, the chemicals of concern (COCs) at the Beloit Corporation NPL site are chlorinated VOCs in groundwater and soil.

The distribution of VOCs in groundwater on and around the NPL site is grouped into three plume categories that incorporate the five separate areas of VOCs identified in the RI report. These three areas and plumes are entitled:

- **Groundwater VOC Source Area** – on the Beloit Corporation property near the current location of the Erection Bay.

- **On-Property Groundwater Plume** – on the Beloit Corporation property. This plume includes all the VOC contaminated groundwater detected in the central portion of the Beloit Corporation property.

- Off-Property Groundwater Plumes – off the Beloit Corporation and NPL site boundaries. This off-property area includes the following groundwater plumes and areas of VOC groundwater contamination, described in the RI as the:

  - TCE Plume
  - That portion of the On-Property Groundwater Plume that extends south of the NPL Site into the Village of Rockton
  - Southern Blackhawk Acres Subdivision Wells.

Groundwater VOC Source Area. Due to soil and groundwater concentrations of PCE in monitoring wells W23/W23B and W36C, the southern area of the Erection Bay is believed to be the source area for the On-Property Groundwater Plume. Based on the low VOC concentrations present in the unsaturated zone soils at this location, the vadose zone does not appear to present a significant ongoing source of VOCs to the underlying groundwater. However, although non-aqueous phase liquids (NAPLs) have not been identified at the Erection Bay source area, concentrations of PCE in groundwater in excess of 4,000 µg/L suggest the possible presence of residual NAPL in soils below the water table at the Erection Bay. Similar high levels of PCE in groundwater have been persistent at this location, despite the implementation of the ISCA pump and treat system and the existence of a treatment system extraction well in the vicinity.

Based on laboratory and field screening results, the Erection Bay area containing VOCs in excess of 1,000 mg/L in groundwater is estimated to be approximately 100 feet by 120 feet (12,000 square feet). It is conservatively estimated that the plume in this area extends to a depth of approximately 60 feet bgs. Given that the water table is approximately 20 feet bgs,

the saturated thickness of the plume is approximately 40 feet. Using an aquifer porosity value of 0.3, the resulting volume of groundwater in this area (i.e., the area encompassed by the 1,000 mg/L VOC contour) is approximately 1.07 million gallons.

On-Property Groundwater Plume. The On-Property Groundwater Plume consists of the area on the Beloit Corporation property described in the RI (Section 4.3.2.2) as the PCE Plume Central Beloit Corporation Property. The VOCs consist primarily of PCE, with small percentages of TCE and cis-1, 2-dichloroethene (cis 1,2-DCE), as degradation products of PCE, and low concentrations of 1,1,1-TCA. It is conservatively estimated that this plume extends to an average depth of 70 feet bgs, with a total saturated thickness of 50 feet (the depth to the water table is approximately 20 feet bgs). The vertical extent of chlorinated VOCs is limited to the sand and gravel unit that overlies a clay layer present at a depth of 56 to 90 feet below the NPL site. Using an aquifer porosity value of 0.3, the resulting volume of contaminated groundwater in the On-Property Plume is approximately 196 million gallons.

The PCE released in the vicinity of the Erection Bay is present in the upper portion of the shallow aquifer below the Beloit Corporation property and comprises the majority of the On-Property Groundwater Plume. 1,1,1-TCA, TCE, 1,1-dichloroethene (1,1-DCE), and 1,2-DCE are also present and migrating in groundwater below the Beloit Corporation property. These VOCs are believed to be daughter products from the breakdown of PCE released at the Erection Bay, or are from historical sources located near the BCP or FSDA that have since dissipated. The current, contiguous downgradient limit of this plume extends to extraction well EW03. The plume is contained on the Beloit property by the ISCA pump and treat system, that has effectively isolated this portion of the plume from the plume that has migrated off-property (See Figure 3). Prior to operation of the ISCA pump and treat system, the plume was shown to extend into the Village of Rockton (the off-site portion of this plume in the village is included in the "Off-Property Plume" described below).

Off-Property Groundwater Plumes. The Off-Property Groundwater Plumes consist of the plumes/areas described below:

- Deep TCE Plume- identified in wells in the southern portion of the Beloit property, near the Soterion facility and in the Village of Rockton,
- Shallow TCE/PCE Plume- that portion of the On-Property Groundwater Plume that extends south of the NPL site into the Village of Rockton
- Southern Blackhawk Acres Subdivision Wells- residential wells containing PCE and 1,1,1-TCA.

The area of the Off-Property Groundwater Plumes within the total VOC concentration contour as defined on Figure 3 is conservatively assumed to extend to the Rock River. This is a conservative assumption, because the southern portion of these plumes is only delineated by monitoring results from the four wells (W43C, W47C, W48C, and W49C) within the Village of Rockton. This area is approximately 156 acres. These plumes are estimated to have an

average depth of 85 feet bgs, with a total saturated thickness of 65 feet (i.e., the high water level is about 20 feet bgs). Using an aquifer porosity value of 0.3, the resulting volume of the Off-Property Groundwater Plumes is approximately 991 million gallons.

The Deep TCE Plume consists primarily of TCE, with minor concentrations of 1,1,1-TCA, PCE, and 1,1-DCE. This plume is found deeper in the shallow aquifer at a depth of approximately 70 feet. The Deep TCE Plume comprises the bulk of contamination shown in off-property areas on Figure 3. While the source of the Deep TCE Plume is unknown, it is believed to be in the vicinity of wells W26C and W18, near the southeast corner of Beloit property and the northwest corner of the Soterion facility. Extensive sampling of soils and groundwater in these areas did not indicate the presence of residual TCE in the soils. However, the groundwater data provide evidence that a historical release of TCE occurred in this area, even though the source has since dissipated. The head of the Deep TCE Plume is currently being captured by extraction well EW04 of the on-site ISCA pump and treat system. As a result, TCE concentrations in the Off-Property Plume are attenuating and have decreased from 180 µg/L in 1998, to approximately 60 µg/L. Based on measured groundwater flow direction and gradient (which is southerly towards the Rock River) and concentration versus distance plots of data from wells screened in the plume centerline, the Deep TCE plume has reached its maximum extent and maximum concentrations and is believed to be discharging to the Rock River at low concentrations (i.e., less than 20 µg/L).

The VOCs detected in the upper and middle portion of the shallow aquifer south of the NPL site and in the Village of Rockton are believed to be an extension of the On-Property Groundwater Plume originating on Beloit property. These compounds were identified in the RI by groundwater screening results and by concentrations measured in monitoring well W48C. This plume approximately overlies the Deep TCE Plume discussed above and is primarily comprised of TCE, with lesser concentrations of 1,1,1-TCA and PCE. Prior to initiation of the ISCA pump and treat system in 1996, the maximum VOC concentration detected was TCE at 30 µg/L. However, VOC concentrations are diminishing and quarterly monitoring has shown that concentrations of TCE, PCE and 1,1,1-TCA have all been below their respective MCLs in this portion of the aquifer since October 1999.

The VOCs detected in the Southern Blackhawk Acres subdivision wells (at 910 Watts, 914 Watts, and 918 Watts) are primarily PCE and 1,1,1-TCA. Investigations conducted during the RI have not identified the source of the VOCs at these private wells, but the compounds detected are similar to those found on the Beloit property. Based on historical data, maximum concentrations of 1,1,1-TCA and PCE were approximately 400 µg/L and 300 µg/L, respectively, in private wells. Point-of-entry carbon filtration systems were installed on these private wells in 1993. The extent of VOCs in this area is delineated by the surrounding private well sampling results. This includes private wells to the north on Watts Ave. (1004 Watts) where no PCE was detected and to the east where low or no PCE was detected (905 and 909 Watts). Well W44C and well nest G103S/G103D/W18 did not detect PCE to the east or west of these private wells. Well W50C, located to the south of well W18 detected a minor amount of PCE. Declining concentrations of VOCs in the wells sampled, as described in the RI, indicate that the source of PCE and 1,1,1-TCA to these wells is dissipating, possibly due

to initiation of the ISCA pump and treat system. On-going monitoring by the Illinois EPA has shown that the concentration of VOCs in private wells has also been declining.

Two areas of VOCs on the NPL site are not included in the Off-Property Groundwater Plumes although VOCs were detected in these areas during the early phases of the RI. These areas include the VOCs present in the northern portion of the subdivision and the VOCs detected at 1102 Blackhawk Avenue (eastern portion of the subdivision). The VOCs present in the northern portion of the subdivision were historically limited to chloroform, centered at 1310 Blackhawk Avenue. However, there was no chloroform detected during recent sampling of this well and the source is believed to have dissipated. In addition, the chloroform is unrelated to the VOCs present on the Beloit Corporation property. The RI attributes the source to a septic tank or swimming pool in the vicinity of 1310 Blackhawk Avenue. Therefore, this area is not included in the Off-Property Groundwater Plumes.

An isolated occurrence of TCE and low concentrations of 1,1,1-TCA and 1,1-DCA were detected at 1102 Blackhawk Avenue. The extent of these VOCs was limited to this single private well. No VOCs were detected at 1102 Blackhawk Avenue during the February 1999 sampling round. Previously, a downgradient private well (at 1012 Blackhawk Avenue) had lower concentrations of the same compounds and TCE was not detected in groundwater directly upgradient of 1102 Blackhawk Avenue. The TCE is believed to be from a local source and the lack of detectable concentrations since 1999 indicates that this plume has dissipated. Therefore, this area is not included in the Off-Property Groundwater Plumes.

Affected Aquifer and Surface Water

The NPL site is located over the ancestral Pecatonica - Sugar Rivers Bedrock Valley, where it merges with the Rock River Bedrock Valley. The glacial deposits beneath the NPL site consist of a coarse upper outwash, primarily in the vadose zone; a fine-grained middle outwash, typically at or below the water table; and a coarse-grained lower outwash, which is bounded below by a lacustrine clay deposit that extends laterally beneath the site.

The shallow aquifer identified at this site consists of the outwash deposits present above the lacustrine clay unit. The depth to groundwater is approximately 20 feet and is generally unconfined across the site. The groundwater at the site and within the village of Rockton meets the standards of Title 35 Illinois Administrative Code (35 IAC) Part 620.210 Class I, Potable Resource Groundwater.

In general, groundwater flow is toward the southwest and south, ultimately discharging to the Rock River south of the Village. VOCs in groundwater are present on the Beloit Corporation property, originating from the Erection Bay. VOCs (primarily TCE) from other or unknown sources are also present within the Blackhawk Acres subdivision and south of the Beloit Corporation property in the deeper portion of the shallow aquifer.

VOCs released from the vicinity of the Erection Bay have migrated, along with groundwater, to the southwest, essentially parallel to the river. The natural discharge area for groundwater

originating on Beloit property would be the Rock River south of the Village. However, the ISCA pump and treat system has been capturing this groundwater. The effectiveness of the system will continue to be monitored and adjustments will be made as necessary, to maintain the groundwater capture on the property.

The rates of groundwater flow (prior to the ISCA pump and treat system) vary from 0.26 feet per day to 3.14 feet per day on the Beloit Corporation property. The rates of VOC migration are affected to some degree by sorption, which reduces the migration rate relative to groundwater flow.

Groundwater flow directions within the Blackhawk Acres subdivision and south of the Beloit Corporation property have been (prior to the ISCA) to the southwest and south. Ultimate discharge of these VOCs would be to the Rock River south of the village.

The rates of groundwater flow south of the Beloit Corporation property vary from 0.23 feet per day to 1.10 feet per day. Adjacent to the site, groundwater flow may be reversed or slowed under the influence of extraction well EWO4. Flow rates and flow directions for the majority of the plume south of the site are unaffected by the ISCA pump and treat system.

After implementation of the ISCA pump and treat system, groundwater flow on the Beloit property and along the southwest side of the Blackhawk Acres subdivision was captured by the extraction wells. This is illustrated by the water table map in Figure 4. VOCs within the capture zone of the ISCA pump and treat system are removed and treated by air stripping. The VOCs outside the capture zone will continue to migrate to the Rock River south of the village. Dilution and sorption will attenuate VOC concentrations throughout the 4,600-foot flow path from the south end of the NPL Site to the Rock River.

Mass loading of VOCs to the river was estimated during the RI. The estimated potential groundwater and VOC discharge rates from the Deep TCE plume to the Rock River are 12,000 cubic feet per day (0.138 cubic feet per second) and 0.1 pounds per day, respectively. These assumptions are based on the estimated groundwater flow rates, the estimated TCE plume width and thickness, and the maximum VOC concentrations measured in groundwater in the Off-Property Plume (180 µg/L). The calculated VOC loading rate is less than the NPDES permit for TCE for the ISCA pump and treat system (0.15 pounds per day).

Surface run-off water can be a migration pathway when precipitation comes in contact with contaminated materials or wastes. However, on the Beloit Corporation property, there are little, if any, constituents of concern present in the near surface soils. The only areas with concentrations of potential concern are at subsurface depth in the Erection Bay source area and beneath the foundry sand disposal area. Therefore, release of VOCs or SVOCs to surface water through direct contact and runoff is not of concern at this site.

Current and Future Potential Land and Resource Uses

Land Use. The NPL Site primarily consists of the Beloit Corporation property and the Blackhawk Acres subdivision. The Beloit Corporation occupies approximately 200 acres. Approximately 75 acres of the land is occupied by the BCRC, BCP and related areas (including the gravel pit, parking areas and SYA). The remainder of the land (approximately 125 acres) is mainly unused at the present time. Approximately 39 acres to the south of the BCP and SYA are open field (the FSSA). Approximately 86 acres to the south and west of the BCP is within the floodplain of the Rock River and is heavily wooded (excluding the Rock River backwater area). The property has been used for industrial purposes since 1957 and will likely be used for industrial purposes in the future. A restrictive covenant will be placed on the Beloit property to prohibit potential future residential use of the property.

The Blackhawk Acres subdivision consists of approximately 70 homes located east of the Beloit Corporation property. This area is separated from the Beloit Corporation property by a railroad line and a wooded area along the railroad tracks. The future land use for the subdivision is anticipated to remain primarily residential.

The industrial and commercial facilities in the vicinity of the Beloit Corporation include Rockton Excavating, Safe-T-Way (in the Blackhawk Acres subdivision), Soterion, Taylor, Inc., and the Rockton Bus Company (south of Taylor, Inc.). A filling station and various small retail businesses are present along Illinois State Highway 75, southeast of the subdivision. The area west of the Rock River is farmland.

Other residential areas include the City of South Beloit located to the north, and the Village of Rockton located to the south and southeast. The City of South Beloit has a population of approximately 5,397. The Village of Rockton has a population of 5,296, according to the census of 2000. Land use in the Village of Rockton, contiguous with the off-site plume, is primarily residential, with industrial zoning located near the Rock River.

Resource Use

Groundwater. **Groundwater in the vicinity of the site is classified as a Class I Potable Resource. All the residences within the Blackhawk Acres subdivision on the NPL Site have private water supply and septic systems. The private wells in the subdivision draw water from the shallow sand and gravel aquifer. The Blackhawk Acres subdivision is in an unincorporated portion of Winnebago County. The Village of Rockton municipal water distribution system extends to the southern boundary of the Blackhawk Acres subdivision. Extension of the water distribution system to the four residences currently using point-of-use carbon filtration systems, and to other residences in the subdivision, is a contingency, if the** residences' private wells show VOC concentrations in excess of the MCLs or Illinois Class I groundwater standards after a five-year review period.

Six high-capacity groundwater production wells were identified within two miles (approximately) of the Site. These wells include Village of Rockton production wells Numbers 5, 6 and 7, and three Beloit Corporation production wells. The operating Beloit

Corporation wells utilize lower aquifers that are separated from the shallow sand and gravel aquifer by more than 40 feet of silty clay. The Beloit Corporation wells are used for fire protection and drinking water. A covenant prohibiting the use of the shallow aquifer will be required for the Beloit Corporation property.

Village of Rockton residences south of the NPL Site boundary have been using the Village of Rockton municipal supply since the mid 1950s. This supply is not chemically impacted by the NPL Site. Village production well No. 5 extends to a depth of 120 feet in the sand and gravel aquifer downgradient of the Site. However, this well is approximately 2,000 feet side gradient of the Off-Property VOC plume and is not expected to be impacted by this plume. Other Village wells extend to a depth of 600 to 700 feet in bedrock and are not in the pathway of the Beloit Corporation plumes.

In 1997, the Village identified 10 addresses with private wells potentially downgradient of groundwater containing VOCs (i.e., residences or commercial properties not using the municipal supply). One of these private wells was found to have VOCs slightly exceeding MCLs and Illinois Class I groundwater standards. This residence was subsequently connected to the Village municipal water supply at the Beloit Corporation's expense. The other nine addresses continue to use their private wells, since the plumes (based on annual groundwater tests conducted by the Illinois EPA) have not impacted them.

Local ordinances have been established that directly affect groundwater use in Winnebago County and in the Village of Rockton. The Winnebago County Health Department has an ordinance on private well construction. In general, this ordinance does not allow construction of a new private well where a public water supply distribution system is available. This prohibition against new wells applies to areas within the Village of Rockton and to the southern portion of the NPL site that is located near the Village distribution system.

The Village has also established ordinances designating groundwater protection areas (GWPAs) around municipal water supply wells. These ordinances include regulations applicable to permitted activities within minimum and maximum setback zones and within the five-year capture zones of the each of the municipal wells.

Surface Water. The NPL site is bounded to the west by the Rock River. There is a dam on the river, approximately 400 feet downstream of the southern boundary of the NPL site. The dam maintains the required water elevations for a raceway that runs along the west side of the Village of Rockton to a hydroelectric power generation plant located on the southwest side of the village. The river in the vicinity of the NPL site is also used for recreation and fishing. It is anticipated that these uses will be continued in the future. No other surface water bodies exist at the site.

2.6 SUMMARY OF SITE RISKS

A baseline risk assessment (BLRA) was conducted as part of the RI for the NPL site to evaluate potential risks to human health and the environment (in the absence of remedial actions) and to support the determination of the need for site remediation. The BLRA examined the presence and release of chemicals from the site, the observed levels of chemical contaminants in the environment, the potential routes of exposure to human and ecological receptors and the likelihood of adverse health effects following contact with contaminated environmental media. The BLRA was conducted by the Beloit Corporation, in accordance with Subpart E, Section 300.430(d) of the revised NCP, as promulgated on March 8, 1990, and included a human health and screening level ecological assessment. The Illinois EPA approved the final BLRA Report dated January 2001. U.S. EPA's *Risk Assessment Guidance for Superfund, 1989: RAGS Vol.1* and *Ecological Risk Assessment Guidance for Superfund: Process for Designing and Conducting Ecological Risk Assessments, 1997* were used as primary sources of information in the development of the BLRA.

Human Health Risks

The human health portion of the BLRA involved four key steps: the identification of COPC; an exposure assessment; a toxicity assessment; and a risk characterization. In addition, a qualitative assessment of the effect of uncertainty on the risk assessment of the Beloit Site was presented. Based on the results of the BLRA, a subset of the COPC evaluated in the RI was included in the response action proposed in this ROD.

Selection of COPC

The BLRA was based on data and information primarily obtained during the RI. The selection of COPC consisted of a review of the RI data for the media sampled to derive a list of site-related chemicals most likely to be of concern to human health and the environment. Chemical results were evaluated to exclude chemicals not detected in the given media, chemicals associated with blank contamination and chemicals that are considered essential human nutrients (e.g., calcium, iron, magnesium, potassium, etc.). COPC were also compared to area background concentrations. The background concentration for a specific chemical is defined as that which is typical for areas near the site, but that have not been impacted by the site. COPC detected above background are carried through the risk assessment for quantitative risk estimation with the human health evaluation. Based on these evaluations, numerous COPC were selected for detailed assessment in the BLRA. Table 2.2 gives the complete list of the COPC at the Beloit Corporation, Rockton Facility NPL Site.

Exposure Assessment

An exposure assessment was conducted to identify potential pathways of concern to human health under both current and future site and surrounding land-use conditions. The following pathways, as summarized in Table 2.1 of this ROD and described in Section 5 of the BLRA, were selected for quantitative evaluation:

Possible Exposure Pathways Under Current Land Use Conditions:

- Residential groundwater use from a private well from within the northern portion of the Blackhawk Acres subdivision impacted by chloroform.

- Residential groundwater use from a private well from within the other portions of the Blackhawk Acres subdivision with VOCs below MCLs and Illinois Class I groundwater standards.

- Incidental ingestion and dermal absorption of chemicals from surface water by children swimming in the Rock River in the groundwater discharge zone, located south of the Village of Rockton (off the NPL site).

- Incidental ingestion and dermal contact with sediment by children trespassing and playing along the banks of the Rock River adjacent to the Beloit Corporation property.

- Incidental ingestion and dermal contact with surface soil by children trespassing on the Beloit Corporation property.

- Incidental ingestion, inhalation and dermal contact with surface soils and inhalation of fugitive vapors by employees on Beloit Corporation property working in areas of exposed soils.

- Incidental ingestion, inhalation and dermal contact with surface and subsurface soils and inhalation of fugitive vapors by construction workers digging in soils on the Beloit Corporation property.

Possible Exposure Pathways Under Hypothetical Future Land Use Conditions:

- Use of groundwater from a private well south of the Beloit Corporation property in the Village of Rockton (assumes COPC concentrations similar to monitoring well W47C).

- Use of untreated shallow groundwater from a residence on Beloit Corporation property.

- Use of untreated groundwater from a private well within the southern Blackhawk Acres subdivision that contained COPC above MCLs and Illinois Class I groundwater standards (assumes no point-of-entry filtration system in place).

- Use of untreated groundwater from a private well within the eastern Blackhawk Acres subdivision that contained COPC above MCLs and Illinois Class I groundwater standards (assumes no point-of-entry filtration system in place).

- Employees hypothetically spending their careers working adjacent to construction projects and inhaling dust at a rate similar to construction workers.

- Exposure to soils with COPC by construction workers digging in soils on the Beloit Corporation property.

Exposure estimates were calculated for each potentially exposed population by media and route of exposure. Quantification of chemical exposure included the following:

1. Estimating the chemical concentration in impacted media to which a receptor may be exposed (i.e., the exposure point concentration). The maximum chemical concentrations found in soil, groundwater or sediment in each area evaluated was used to represent the exposure point concentration for receptors in the particular area.

2. Estimating the amount of exposure a receptor may have with the media containing the COPC on a daily basis.

3. Estimating the duration and frequency of the exposure.

This information was integrated to calculate a receptor's average daily chemical intake during the period of exposure. Section 5 of the BLRA details the exposure assessment and quantification of exposure point concentrations for the Beloit NPL site. Exposure point concentrations for each of the COPC are presented by medium and receptor in Tables 2.3 through 2.11.

In accordance with U.S. EPA guidance, the BLRA examined a reasonable maximum exposure (RME) associated with each pathway of concern. RME risk estimates for future land use were also evaluated as a basis for evaluating potential remediation of the site. U.S. EPA risk assessment guidance defines the RME to be "the highest exposure that is reasonably expected to occur at a site" (U.S. EPA, 1989). The RME is intended to place a conservative (i.e., health-protective) upper limit on the potential risks, meaning that the risk estimate is unlikely to be underestimated but may be overestimated. The likelihood that an RME scenario may actually occur is probably small, due to the many conservative assumptions incorporated into the RME scenario.

Toxicity Assessment

Quantitative estimates of chemical non-cancer or cancer potency (toxicity factors) developed by the U.S. EPA were used in the human health evaluation to quantify risks posed by COPC. Available toxicity factors were presented in the BLRA for each of the exposure pathways and COPC. The toxicity criteria were primarily obtained from U.S. EPA's Integrated Risk Information System (IRIS) and *Health Effects Assessment Summary Tables (HEAST)* (U.S. EPA, 1997).

For human exposure, the U.S. EPA has developed estimates of safe upper limits of chemical intake that, if not exceeded, should not result in non-cancer health effects (e.g., liver disease). These values are termed reference doses (RfDs). RfDs have been developed for both the oral

and inhalation routes of exposure. Dermal RfDs used in the BLRA are estimated, based on the oral RfD and the chemical's oral absorption efficiency.

The U.S. EPA has also developed estimates of the potency of carcinogenic chemicals. These values are termed slope factors (SFs) that relate a person's probability of contracting cancer with the magnitude of the person's chemical intake. Tables 2.12 and 2.13 present chronic oral, inhalation and dermal toxicity values (slope factor/RfDs) for the COPC selected for quantitative evaluation in the BLRA.

Risk Characterization

Estimates of exposure were compared with toxicity information to arrive at an estimate of potential risk. For carcinogens, risks are generally expressed as the incremental probability of an individual's developing cancer over a lifetime as a result of exposure to the carcinogen. Excess lifetime cancer risk is calculated from the following equation:

Risk=CDI x SF

Where:

Risk = a unit less probability (e.g., 2×10^{-4}) of an individuals developing cancer
CDI = chronic daily intake averaged over 70 years (mg/kg-day)
SF = slope factor, expressed as $(mg/kg\text{-}day)^{-1}$.

These risks are probabilities that usually are expressed in scientific notation (e.g., $1x10^{-6}$). An excess lifetime cancer risk of $1x10^{-6}$ indicates that an individual experiencing the reasonable maximum exposure estimate has a 1 in 1,000,000 chance of developing cancer as a result of site-related exposure. This is referred to as an "excess lifetime cancer risk" because it would be in addition to the risks of cancer individuals face from other causes such as smoking or exposure to too much sun. The chance of an individual's developing cancer from all other causes has been estimated to be as high as one in three.

For known or suspected carcinogens, acceptable exposure levels are generally concentration levels that represent an excess upper bound lifetime cancer risk to an individual of between 10^{-4} and 10^{-6}, using information on the relationship between dose and response. The 10^{-6} risk level will be used as the point of departure for determining remediation goals for alternatives when ARARs (spell out, first usage) are not available or are not sufficiently protective because of the presence of multiple contaminants at a site or multiple pathways of exposure.

The potential for non-cancer effects is evaluated by comparing an exposure level over a specified time period (e.g., a lifetime) with a reference dose (RfD) derived for a similar exposure period. An RfD represents a level that an individual may be exposed to that is not expected to cause any deleterious effect. The ratio of exposure to toxicity is called a hazard quotient (HQ). An HQ less than 1 indicates that a receptor's dose of a single contaminant is less than the RfD, and that toxic non-cancer effects from that chemical are unlikely. The Hazard Index (HI) is generated by adding the HQs for all COPC that affect the same target

organ (e.g., the liver) or that act through the same mechanism of action within a medium or across all media to which a given individual may reasonably be exposed. An HI less than 1 indicates that, based on the sum of all HQ's from different contaminants and exposure routes, toxic non-cancer effects from all contaminants are unlikely. An HI greater than 1 indicates that site-related exposures might present a risk to human health.

The HQ is calculated as follows:

HQ = CDI/RfD

Where:

CDI = *chronic daily intake*
RfD = reference dose.

CDI and RfD are expressed in the same units and represent similar exposure periods (i.e., chronic, subchronic or short-term).

The findings of the baseline risk assessment indicate that estimated excess lifetime cancer risks were below or within the 1×10^{-4} to 1×10^{-6} risk range, and non-cancer hazard indices were at or below 1 for all of the current exposure scenarios evaluated in the BLRA.

Under the hypothetical future scenarios, there is the potential for an excess lifetime cancer risk greater than 1×10^{-4} or a hazard index greater than 1. The following exposure scenarios resulted in risks above the generally accepted range:

- Domestic use of untreated groundwater containing COPC above MCLs and Illinois Class I groundwater standards by residents of the Blackhawk Acres subdivision. An excess cancer risk of 1.6×10^{-4} was estimated for southern Blackhawk Acres subdivision residents using untreated groundwater containing COPC above MCLs and Illinois Class I groundwater standards for domestic purposes. The cancer risks were due to 1,1-DCE (73 percent of total risk), and PCE (27 percent).

Chemical of Concern	Totals
1,1-DCE	1.1E-04
PCE	4.3E-05
Reasonable maximum exposure (RME)	1.6E-04

- Domestic use of groundwater from private wells in the Village of Rockton hypothetically affected by concentrations of COPC similar to those detected in monitoring well W47C (this monitoring well historically contained the highest concentration of COPC detected in Village monitoring wells). Under this scenario, an excess cancer risk of 2.8×10^{-4} and a non-cancer hazard index of 1.8 were calculated, assuming residents would use untreated groundwater for domestic purposes. The cancer risks were due to 1,1-DCE (67 percent of total risk), TCE (27.6 percent), and carbon tetrachloride (4.5 percent).

Chemical of Concern	Totals
1,1-DCE	1.9E-04
Carbon Tetrachloride	1.3E-05
TCE	7.8E-05
Reasonable maximum exposure (RME)	2.8E-04

- An excess lifetime cancer risk of 7.3×10^{-3} is associated with domestic use of untreated groundwater at the Beloit Corporation property by a hypothetical future resident on the Beloit Corporation property. Tetrachloroethene, 1,2-DCA, and 1,1-DCE account for 50.6 percent, 24 percent and 22.7 percent of the risk, respectively. A non-cancer hazard index of 49 was associated with domestic use of the water, primarily due to 1,2-DCA (HQ = 25) and PCE (HQ = 18). HQ for 1,2-DCE and for nickel slightly exceeded 1 (1.6 and 1.4, respectively).

Chemical of Concern	Totals
Chloromethane	3.8E-05
1,1-DCE	1.7E-03
1,2-DCE	1.8E-04
Carbon Tetrachloride	1.3E-05
TCE	6.9E-05
PCE	3.7E-03
Heptachlor	2.7E-05
Arsenic	5.2E-05
Reasonable maximum exposure (RME)	7.3E-03

- A hazard index of 1.4 was calculated for employees working exclusively in areas of contaminated soil; however, estimated HQs were below 1 for each individual COPC in this scenario.

Based on the findings above, 1,1-DCE, 1,2-DCA, carbon tetrachloride, TCE and PCE are the significant contributors to the estimated excess cancer risks for the future groundwater scenarios and are considered the chemicals of concern (COC) for the NPL site. The estimated excess cancer risks presented above do not include risks associated with vapor intrusion into residential homes. In order to evaluate the relative contribution of the vapor intrusion pathway to risks estimated for current residents, US EPA's version of the Johnson and Ettinger (1991) model for subsurface vapor intrusion into buildings was used as a screening tool. The results of the screening, shown in Table 2.16, demonstrate that the risks posed by vapor intrusion do not significantly impact the risks estimated for current residents. Estimated excess cancer risks associated with vapor intrusion contribute only 1% to 3.6% to the total risks posed by the COCs.

PCE and 1,2-DCA are also the primary COC contributing to the non-cancer risks associated with groundwater use. The HQ for 1,2-DCE and nickel in on-site groundwater slightly exceeded 1 for the hypothetical residential receptor; however, the RfD for (cis) 1,2-DCE was used to assess total 1,2-DCE as a conservative measure. Nickel was detected in only 1 out of 48 samples at a concentration above its risk based screening level. This maximum detected value was the basis of the estimated non-cancer risk. Based on the number of uncertainties associated with the exposure estimates (discussed below) and toxicity values, total 1,2-DCE and nickel are not considered to drive risks associated with the on-site groundwater. The estimated health risks for the scenarios and COC driving calculated risks for the NPL site are presented in Tables 2.14 through 2.18.

Based on this assessment, the response action selected in this ROD is necessary to protect public health and welfare or the environment from actual or threatened releases of pollutants or contaminants from this site that may present an imminent and substantial endangerment to public health or welfare.

General Assumptions and Uncertainty Associated with the Baseline Risk Assessment

The risk assessment process incorporates a number of conservative assumptions so that the cancer risks and non-cancer health hazards estimates represent upper-bound estimates that may overestimate, but are not likely to underestimate actual risks. Thus, calculated risk estimates are not to be construed as necessarily representing actual risks.

The risk assessment uses hypothetical scenarios and conservative assumptions to quantify potential risks for current and future land uses that may or may not reflect actual risks. For instance, it is assumed in the BLRA that chemical concentrations in the study area do not change over time. This is unlikely, because biodegradation, volatilization, transport and other physical, chemical and biological processes will likely diminish the chemical concentrations over time. Therefore, the estimated risks in this report may change according to the fate and transport of chemicals.

A BLRA based on U.S. EPA guidance documents makes the following assumptions to estimate health risks:

- No corrective actions will take place.
- No groundwater use restrictions will be applied.
- There is the potential for future development of the site.

These assumptions dramatically affect the exposure scenarios selected for a site and the media (surface soils, groundwater, sediment, etc.) to which persons are exposed. This has a significant impact on the magnitude of the risk levels attributable to the site by the BLRA.

Most of the chemicals that were associated with risks above de minimis levels were based upon the maximum detected concentrations in a single well or sample. In addition, the U.S. EPA approach used to calculate RME pathways are likely to result in overestimation of risks. For example, the assumption that individuals in the site area would engage in certain activities that would always result in exposure on a regular basis over many years is conservative. Similarly, the assumption that a residence could be built on the site in the future is hypothetical.

Uncertainty is inherent in the selection or derivation of key input parameters and in conducting analyses. Results of the BLRA must be viewed as estimates that span a range of possible values that may be understood only in light of the fundamental assumptions and methods used in the evaluation. Given that the verified toxicity measures used in the BLRA are established by the U.S. EPA, the greatest uncertainties are associated with the determination of exposure point concentrations, the development of exposure scenarios and the derivation of long-term intake or dose estimates for the human receptors at greatest risk

Ecological Assessment

The first step of the ecological assessment involved a problem formulation stage to determine the assessment and measurement endpoints. After the assessment and measurement endpoints were determined, the analysis was performed. The analysis consisted of comparing the level of ecological receptor exposure (through the use of sediment and soil data) with screening levels of ecological toxicity benchmarks.

COPC identified in the human health risk assessment were used to represent the chemicals of potential ecological concern (COPEC) for the screening level ecological assessment. The data from the RI was culled to include only that from areas on the NPL site that could be utilized as ecological habitat and was limited to surficial soils and sediment to which most biological receptors would potentially be exposed. The Rock River surface water was not considered in the screening level assessment because the fate and transport analysis (conducted during the RI) concluded that the river would dilute any groundwater discharged to it and would reduce the concentrations of COPEC below levels of detection or concern. Analytical modeling of the potential concentrations of COPEC in Rock River sediment pore water resulting from groundwater upwelling indicated that pore water concentrations would be less than EPA Region 5 Ecological Screening Levels (ESLs) and that no adverse impacts to benthic organisms would be anticipated.

In the ecological assessment, exposure pathways were assessed on the basis of current site conditions. The potential for ecological receptor exposure was not anticipated to change (i.e., become greater) under future site conditions.

Benchmarks to estimate the toxicity of each COPEC to sediment and soil associated biota were obtained from publications of the U. S. Department of Energy (Oak Ridge National Laboratory). Plant toxicity was based on visual observation. Aquatic animal toxicity was based on a comparison to safe surface water concentrations obtained from literature, or to U.S. EPA Ambient Water Quality Criteria.

Based on the results of the screening level ecological assessment, levels of analytes detected in wetland and terrestrial habitats would not be expected to pose a health concern to ecological receptors. For this reason, additional ecological risk assessment was not considered necessary for purposes of the BLRA.

2.7 REMEDIAL ACTION OBJECTIVES

Remedial action objectives (RAOs) are specific goals for protecting human health and the environment. The RAOs describe the intended results of the remedial action for each media of concern. Specific remedial action objectives have been developed for each portion of the groundwater VOC plume areas, in consideration of the long-term goals of protecting human health and the environment, reducing exposure to the detected COC and achieving compliance with ARARs.

Groundwater VOCs Source Area

The remedial action objectives for the Groundwater VOCs Source Area are as follows:

- To control the source of COC in groundwater to the extent practicable and to prevent or minimize further migration of contaminants from source materials to ground water.

- Under current land use conditions and future hypothetical land use conditions, prevent the domestic use (e.g., drinking, bathing, etc.) of the groundwater from the source area containing COC.

- Remediate the Groundwater VOC Source Area to achieve compliance with the more stringent of either the MCLs or applicable Groundwater Quality Standards (35 IAC Part 620), including 35 IAC Part 620.410 Class I Groundwater Quality Standards for Class I Potable Resource Groundwater, or 35 IAC Part 620.450 Alternative Groundwater Quality Standards. At a minimum, contaminated soil and groundwater in the source area that exhibit a characteristic of a hazardous waste or contain listed hazardous wastes, will be removed or treated to non-hazardous levels.

On-Property Groundwater Plume

The remedial action objectives for the On-Property Groundwater Plume are as follows:

- Manage or treat the On-Property Groundwater Plume to prevent or minimize further migration of the groundwater COC to properties located outside the Beloit Corporation property boundaries.

- Under current land use conditions and future hypothetical land use conditions, prevent the use of the On-Property Groundwater Plume containing COC for drinking water or other associated domestic purposes.

- Remediate the On-Property Groundwater Plume containing COC to achieve compliance with the applicable standards in IAC Part 620, including 620.410 Groundwater Quality Standards for Class I Potable Resource Groundwater, or 620.450 Alternative Groundwater Quality Standards. Contaminated groundwater that exhibits a characteristic of a hazardous waste or contains listed hazardous waste, will be removed or treated to non-hazardous levels.

Off-Property Groundwater Plumes

The remedial action objectives for the groundwater containing COC outside the Beloit Corporation property boundaries are as follows:

- Under current land use conditions and future hypothetical land use conditions, prevent potential exposure to COC released from the Beloit Corporation Groundwater VOC

Source area and On-Property Groundwater Plume area. Potential receptors under current land use conditions and future hypothetical land use conditions are considered to be residents (adults and children) of the Blackhawk Acres subdivision and the Village of Rockton.

- Remediate the Off-Property Groundwater Plume containing COC to achieve compliance with the more stringent of either the MCLs or applicable standards in IAC Part 620, including 620.410 Groundwater Quality Standards for Class I Potable Resource Groundwater, or 620.450 Alternative Groundwater Quality Standards. Contaminated groundwater that exhibits a characteristic of a hazardous waste or contains listed hazardous waste, will be removed or treated to non-hazardous levels.

It is important to note that remedial actions for the On-Property Groundwater Plume will also aid in the remediation of the Off-Property Groundwater Plumes, either through the control of the migration of this plume to off-property wells or through the direct remediation of these plumes via carryover from actions taken on the Beloit Corporation property.

IAC Part 620 contains the groundwater standards used as the ARARs for this site. IAC Part 620.410 Groundwater Quality Standards for Class I Potable Resource Groundwater includes the standards for Class I groundwater at the site. IAC Part 620.450 Alternative Groundwater Quality Standards is an important reference for this site and may be applied to this medium and considered at each of the 5-year reviews. Also, at each five-year period, the effectiveness of the remedial actions will be assessed, appropriate modifications made and it will be determined whether Alternative Groundwater Quality Standards under IAC Part 620.450 are appropriate for the site.

2.8 DESCRIPTION OF ALTERNATIVES

This section describes the comprehensive alternatives for protection of human health and the environment that were developed and evaluated in the FS. Human health alternatives for the site were developed, analyzed and compared following U.S. EPA guidance. This section summarizes the components of each of the alternatives

The Selected Remedy is described in Section 2.11. The alternative development process for human health protection included identification of all potentially applicable technologies and process options; screening of technologies and process options on the basis of technical implementability; and evaluation and screening of retained technologies and process options based on effectiveness, implementability and cost. The retained process options were then assembled into alternatives that cover a range of remedial options, including "no action," as required by the NCP.

Alternative 1 – No Action

The No-Action Alternative involves taking no additional action at the site and includes shutdown of the ISCA pump-and-treat system. The contaminated soil and groundwater would

remain in place. This alternative is provided as a baseline for comparison to the other alternatives and is required by the NCP. This alternative would have no associated costs.

Alternative 2 – On-Property Groundwater Pump and Treat and Off-Property Groundwater Plumes Monitored Natural Attenuation.

This alternative includes the following measures for the On-Property Groundwater Plume:

Estimated Cost:
Capital - $462,034
Annual O&M - $91,300
Present Worth - $1,677,000

- Continued operation of the ISCA pump and treat system.
- Institutional controls, (i.e., a restrictive covenant) to prohibit the use of shallow groundwater on Beloit property for potable purposes.
- Establishment of a Groundwater Management Zone[1] (GMZ) over an area that encompasses the plume.
- Continued monitoring of the On-Property Groundwater Plume to measure the progress of ISCA treatment.

For the Off-Property Groundwater Plumes, the measures include:

- Continuation of the point-of-entry carbon filtration systems in the Blackhawk Acres subdivision with contingency action (extension of the ISCA pump and treat system or provision of a municipal water supply) if COC exceed standards after a 5-year review period.
- Establishment of a GMZ over an area that encompasses the plume.
- Monitored natural attenuation, relying on physical attenuation processes to decrease concentrations in the plumes and continued performance-monitoring data from new and existing monitoring wells.
- As a contingency, if COC attributable to the NPL site are detected in previously unaffected residential wells, the Illinois Department of Public Health (IDPH) will be notified. The IDPH will determine if risk levels are being exceeded and may recommend the potential need for an alternate water supply. If an alternate water supply is recommended, Illinois EPA and U.S.EPA will take appropriate actions under the contingency plan.

This alternative is essentially a continuation of the existing site remediation efforts. This alternative assumes a project life (i.e., remedial timeframe) of 30 years.

[1] A Groundwater Management Zone (GMZ) is a three-dimensional region containing groundwater being managed to mitigate impairment caused by the release of contaminants from a site. Pursuant to 35 IAC Part 620.250, the groundwater management must continue as approved by the Illinois EPA for the GMZ to remain in effect

Alternative 2a – On-Property Groundwater Pump and Treat and Off-Property Groundwater Pump and Treat.

This alternative includes the same remediation measures for the On-Property Groundwater Plume as outlined in Alternative 2.

Estimated Cost:
Capital - $1,636,000
Annual O&M - $175,000
Present Worth- $3,890,000

For the Off-Property Groundwater Plumes, this alternative includes the following measures:

- Construction of a separate extraction well and air-stripping system in the Village of Rockton to treat groundwater that would then be discharged into the Rock River. The configuration and specifications of the extraction and treatment system would be determined during the project design phase.
- Continuation of the point-of-entry carbon filtration systems in the Blackhawk Acres subdivision with contingency action (extension of the ISCA pump and treat system or provision of a municipal water supply) if COC exceed standards after a 5-year review period.
- Continued groundwater monitoring and, if COC attributable to the NPL site are detected in previously unaffected residential wells, Illinois EPA and U.S.EPA will take the appropriate actions under the contingency plan for the site.
- Establishment of a GMZ over an area that encompasses the plume.

This alternative assumes a project life of 30 years.

Alternative 3 – VOC Source Treatment and Off-Property Groundwater Plumes Monitored Natural Attenuation.

This alternative includes the following measures for the VOC source area at the Erection Bay and On-Property Groundwater Plume:

Estimated Cost:
Capital - $740,000
Annual O&M - $46,000
Present Worth - $1,289,000

- Institutional controls, (i.e., a restrictive covenant) to prohibit the use of shallow groundwater on Beloit property for potable purposes.
- In-situ (in place) treatment of source area soil and groundwater at the Erection Bay by chemical oxidation.
- Cessation of the ISCA pump and treat system, but continued monitoring of the On-Property Groundwater Plume.
- Establishment of a GMZ over an area that encompasses the plume.

For the Off-Property Groundwater Plumes, the measures include:

- Establishment of a GMZ over an area that encompasses the plumes.

- Continuation of the point-of-entry carbon filtration systems in the Blackhawk Acres subdivision with contingency action (provision of a municipal water supply) if COC exceed standards after a 5-year review period.
- Monitored natural attenuation, relying on physical attenuation processes to decrease concentrations in the plumes, and continued performance-monitoring data from new and existing monitoring wells.
- As a contingency, if COC attributable to the NPL site are detected in previously unaffected residential wells, the IDPH will be notified. The IDPH will determine if risk levels are being exceeded and may recommend the potential need for an alternate water supply. If an alternate water supply is recommended, Illinois EPA and U.S.EPA will take appropriate actions under the contingency plan.

This alternative assumes a project life of 20 years. Once the source area is remediated, the On-Property Plume is expected to diminish by advection, dispersion, dilution and sorption as the plume migrates toward discharge into the Rock River.

Alternative 3a – VOC Source Treatment and Off-Property Groundwater Pump and Treat.

This alternative includes the same remediation measures for the VOC source area treatment at the Erection Bay with restrictive covenants, cessation of the ISCA pump and treat system and monitoring, as outlined in Alternative 3.

Estimated Cost:
Capital - $1,899,000
Annual O&M - $129,000
Present Worth - $3,327,000

For the Off-Property Groundwater Plume, this alternative includes the following measures:

- Construction of a separate extraction well and air stripping system in the Village of Rockton to treat groundwater that would then be discharged into the Rock River. The configuration and specifications of the extraction and treatment system would be determined during the project design phase.
- Continuation of the point-of-entry carbon filtration systems in the Blackhawk Acres subdivision with contingency action (provision of a municipal water supply) if COC exceed standards after a 5-year review period.
- Continued groundwater monitoring, and, if COC attributable to the NPL site are detected in previously unaffected residential wells, IDPH will be notified. The IDPH will determine if risk levels are being exceeded and may recommend the potential need for an alternate water supply. If and alternate water supply is recommended, Illinois EPA and U.S.EPA will take appropriate actions under the contingency plan.
- Establishment of a GMZ over an area that encompasses the plume.

This alternative assumes a project life of less than 20 years. The controlling factor is the timeframe required for the On-Property Plume to migrate, dilute and disperse, once the source area is remediated.

Alternative 4 – On-Property Groundwater Pump and Treat, VOC Source Treatment by Chemical Oxidation and Off-Property Groundwater Plumes Monitored Natural Attenuation.

This alternative includes the following measures for the On-Property Groundwater Plume and Erection Bay source area:

Estimated Cost:
Capital - $1,123,000
Annual O&M - $92,000
Present Worth - $2,024,000

- Continued operation of the ISCA pump and treat system.
- In-situ treatment of source area soil and groundwater at the Erection Bay by chemical oxidation.
- Institutional controls (i.e., a restrictive covenant) to prohibit the use of shallow groundwater on Beloit property for potable purposes.
- Establishment of a GMZ over an area that encompasses the plume
- Continued monitoring of the On-Property Groundwater Plume to measure the progress of ISCA treatment system.

For the Off-Property Groundwater Plumes, the measures include:

- Establishment of a GMZ over an area that encompasses the plume.
- Continuation of the point-of-entry carbon filtration systems in the Blackhawk Acres subdivision with contingency action (extension of the ISCA pump and treat system or provision of a municipal water supply) if COC exceed standards after a 5-year review period.
- Monitored natural attenuation, relying on physical attenuation processes to decrease concentrations in the plumes and continued performance-monitoring data from new and existing monitoring wells.
- As a contingency, if COC attributable to the NPL site are detected in previously unaffected residential wells, the IDPH will be notified. The IDPH will determine if risk levels are being exceeded and may recommend the potential need for an alternate water supply. The Illinois EPA and U.S.EPA will take appropriate actions under the contingency plan.

This alternative assumes a project life of 15 years. The remedial timeframe, as described in the FS, is based upon conservative estimates and an evaluation of current VOC remediation trends observed in on-site and off-site monitoring wells. Remediation trends in the site monitoring wells were evaluated using quarterly sample results generated since implementation of the ISCA, and first order decay (exponential) trendlines to approximate the remediation timeframes for each well. Calculations of the total VOC concentrations in the site monitoring wells based upon extrapolations of the trendlines, and the time needed for each well to achieve a total VOC concentration of 5 ug/L was used as the basis for the 15-year timeframe

Alternative 4a - On-Property Groundwater Pump and Treat, VOC Source Treatment and Off-Property Groundwater Pump and Treat.

This alternative includes the same remediation measures for the VOC source area and On-Property Plume as outlined in Alternative 4.

For the Off-Property Groundwater Plume, this alternative includes the following measures:

Estimated Cost:
Capital - $2,263,000
Annual O&M - $174,900
Present Worth - $3,919,000

- Construction of a separate extraction well and air-stripping system to treat groundwater in the Village of Rockton that would then be discharged into the Rock River. The configuration and specifications of the extraction and treatment system would be determined during the project design phase.
- Continued groundwater monitoring and, if COCs attributable to the NPL site are detected in previously unaffected residential wells, the IDPH will be notified. The IDPH will determine if risk levels are being exceeded and may recommend the potential need for an alternate water supply. If an alternate water supply is recommended, Illinois EPA and U.S.EPA will take appropriate actions under the contingency plan.
- Establishment of a GMZ over an area that encompasses the plume.

This alternative assumes a project life of 15 years. This is the same remedial time frame as Alternative 4, because the controlling factor is the time required to remediate the On-Property Plume, and is the same for both alternatives.

Alternative 4b - On-Property Groundwater Pump and Treat, VOC Source Treatment with a Dual-Phase Extraction System and Off-Property Groundwater Plumes Monitored Natural Attenuation.

This alternative includes the same remediation measures for the On-Property Plume and Off-Property Plumes as outlined in Alternative 4, with the exception that VOC source treatment would be accomplished with a dual-phase extraction system, instead of chemical oxidation.

Estimated Cost:
Capital - $764,000
Annual O&M - $146,000
Present Worth - $2,109,000

With this system, a high vacuum system is applied to simultaneously remove liquid and gas from the VOC source area. The vacuum extraction well includes a screened section in the zone of contaminated soils and ground water that removes contaminants from above and below the water table. The system lowers the water table around the well, exposing more of the formation. Contaminants in the newly exposed vadose zone are then accessible to vapor extraction.

This alternative assumes a project life of 15 years. This is the same remedial time frame as Alternative 4 because the controlling factor is the time required to remediate the On-Property Plume.

2.9 COMPARATIVE ANALYSIS OF ALTERNATIVES

This section summarizes the comparative analysis of alternatives presented in the detailed analysis section of the FS Report. The major objective is to evaluate the relative performance of the alternatives against nine evaluation criteria (described in the following paragraphs) so that the advantages and disadvantages of each are clearly understood. The first two evaluation criteria, protectiveness and compliance with ARARs, are Threshold Criteria. All alternatives that are carried through the detailed analysis, with the exception of the No Action alternative, are required to meet the threshold of being protective and compliant with ARARS. The next 5 criteria are the balancing criteria and the relative strengths of each alternative with respect to these criteria are analyzed. The final two criteria, State and Community Acceptance, are considered the modifying criteria and these can be used to modify the analysis reached under the other criteria. A summary table that captures the entire Comparative Analysis is presented in Table 2.19.

Overall Protection of Human Health and the Environment

Overall protection of human health and the environment addresses whether each alternative provides adequate protection of human health and the environment and describes how risks posed through each exposure pathway are eliminated, reduced or controlled through treatment, engineering controls and institutional controls.

All of the alternatives, except the no-action alternative, are protective of human health and the environment by eliminating, reducing or controlling risks posed by the site through treatment of groundwater contaminants, institutional controls and natural attenuation. Alternatives 3 and 3A include technologies to remove the VOC source area, but also include the shutdown of the existing ISCA pump and treat system. Removal of the pump and treat system would allow portions of the On-Property Plume to migrate off-site, thereby threatening nearby residential wells that do not have point-of-entry carbon filtration units, making these alternatives potentially the least protective. Alternatives 2 and 2A would provide adequate protection from exposure to contaminated groundwater, however, the source of VOCs to groundwater at the Erection Bay would not be addressed and, therefore, the remedial timeframe would be the longest.

Alternatives 4, 4A and 4B all provide similar and adequate protection from exposure to VOC contaminated groundwater. The protection is afforded by maintaining control of the On-Property Plume with the existing pump and treat system, institutional controls to prevent future use of contaminated groundwater, remediation of the VOC source area to minimize the remedial timeframe and adequate monitoring of the Off-Property Plumes during attenuation, with contingency plans for mitigating exposure, should plume dynamics change during the attenuation period.

Compliance with ARARs

Section 121(d) of CERCLA and NCP §300.430(f)(1)(ii)(B) require that remedial actions at CERCLA sites at least attain legally applicable or relevant and appropriate Federal and State requirements, standards, criteria and limitations which are collectively referred to as "ARARs," unless such ARARs are waived under CERCLA section 121 (d)(4).

Applicable requirements are those cleanup standards, standards of control and other substantive requirements, criteria or limitations promulgated under federal or state environmental or facility siting laws that specifically address a hazardous substance, pollutant, contaminant, remedial action, location or other circumstance found at a CERCLA site. Only those state standards that are identified by a state in a timely manner and that are more stringent than federal requirements may be applicable. Relevant and appropriate requirements are those cleanup standards, standards of control and other substantive requirements, criteria or limitations promulgated under federal or state environmental or facility siting laws that, while not "applicable" to a hazardous substance, pollutant, contaminant, remedial action, location or other circumstance at a CERCLA site, address problems or situations sufficiently similar to those encountered at the CERCLA site that their use is well-suited to the particular site. Only those state standards that are identified in a timely manner and are more stringent than federal requirements may be relevant and appropriate.

Compliance with ARARs addresses whether a remedy will meet all of the applicable or relevant and appropriate requirements of other federal and state environmental statutes or provides a basis for invoking a waiver.

Compliance with ARARs also necessarily requires identification of the regulatory classification of contaminated areas at the site. At the Beloit Corporation site, the exact source(s) of solvent constituents, or the date(s) of their release to the environment are unknown. Therefore, it is assumed that the contaminated environmental media are not considered hazardous wastes and RCRA requirements are not applicable, if all remedial work is completed onsite.

All alternatives, except the No Action alterative, had common ARARs associated with the drinking water standards for groundwater. The use of additional air-stripping facilities and dual-phase extraction would require consideration of emission standards for volatile organics. A permit would also be necessary for any surface discharge of treated water.

All alternatives, except the No Action alternative, would attain their respective federal and state ARARS. However, drinking water standards would not be met through Alternatives 2 and 2A, which do not adequately address the source of VOCs for at least 30 years. These standards may be met by Alternatives 4, 4A and 4B that do include source treatment in approximately 15 years.

Table 2.20 provides a matrix showing the specific ARARs that pertain to each of the various alternatives.

Long-Term Effectiveness and Permanence

Long-term effectiveness and permanence refers to expected residual risk and the ability of a remedy to maintain reliable protection of human health and the environment over time, once cleanup levels have been met. This criterion includes the consideration of residual risk that will remain on site following remediation and the adequacy and reliability of controls.

Each alternative, except the No Action alternative, provides some degree of long-term protection. The alternatives increase in effectiveness of assuring protection against potential exposure, as additional treatment components are included. The effectiveness and permanence of Alternatives 2 and 2A are entirely dependent upon the adequacy of maintenance. Contaminated soil and groundwater at the Erection Bay source area would remain as a potential source of downgradient groundwater contamination. Alternatives 3 and 3A provide a greater degree of long-term effectiveness and permanence with the removal of contaminants from soil and groundwater though treatment.

Alternative 4, 4A and 4B provide the greatest long-term effectiveness and permanence of all the options, because volatile organic compounds are removed in the source treatment process. The effectiveness of monitored natural attenuation to control exposure and reduce off-property groundwater contamination is high, because of the enforceability of institutional controls (via a negotiated consent decree with the Beloit Corporation property owner), the current availability of an alternate water supply and the declining trend in VOC concentrations observed since the ISCA pump and treat system become operational. Alternatives 4, 4A and 4B are equally effective and permanent in restoring ground-water quality by attaining drinking water standards in a reasonable time frame.

Reviews at least every five years, as required, would be necessary to evaluate the effectiveness of any of these alternatives, because hazardous substances would remain on-site in concentrations above health-based levels.

Reduction of Toxicity, Mobility, or Volume Through Treatment

Reduction of toxicity, mobility, or volume through treatment refers to the anticipated performance of the treatment technologies that may be included as part of a remedy.

Alternative 1 does not include treatment as a component of the remedy. Therefore, this alternative would not reduce the toxicity, mobility, or volume of contamination at the site.

All other alternatives include some treatment of VOCs in groundwater as components of the remedy. Alternative 3, 3A, 4, 4A and 4B also include treatment of VOCs in soil as the result of the use of chemical oxidation or dual-phase extraction in the source area at the Erection Bay.

Alternative 4A would provide the greatest reduction in the mobility, toxicity and volume of contaminants through treatment by on- and off-property air stripping of groundwater and on-property oxidation of groundwater and soil. However, Alternatives 4 and 4B would provide only slightly less reductions in the mobility, volume and toxicity of ground-water contamination at the site, because they do not include air stripping of the Off-Property Plumes. Volatile organic concentrations in off-property ground water would still be reduced to drinking water standards through natural attenuation.

Short-Term Effectiveness

Short-term effectiveness addresses the period of time needed to implement the remedy and any adverse impacts that may be posed to workers, the community and the environment during construction and operation of the remedy until cleanup levels are achieved.

Alternative 1, No Action would not be an effective alternative because risks would potentially increase due to the discontinuation of the current pump and treat system.

Alternative 2 could be implemented immediately, because it essentially is a continuation of the existing remediation efforts. The source control components of Alternatives 3, 3A, 4, 4A and 4B would require 1 to 2 years to complete, depending on the time necessary for the oxidation or dual-phase extraction to achieve cleanup levels. The off-property pump and treat component of Alternatives 2A, 3A and 4A would also take approximately 1 to 2 years to construct and make operational. Risk to workers would be greatest under these alternatives, due to the proximity of railroad and vehicle traffic; however, this and all risks to workers (including exposure to hazardous constituents) could be managed through standard safety practices and the use of personnel protective equipment. Workers would be required to wear appropriate levels of protection to avoid exposure during excavation and treatment activities.

Air emissions from the groundwater treatment process (air stripping) would be addressed by engineering controls to ensure that the emissions meet applicable federal or state air emission standards, mitigating any adverse on- or off-site impacts.

Implementability

Implementability addresses the technical and administrative feasibility of a remedy from design through construction and operation. Factors such as availability of services and materials, administrative feasibility and coordination with other governmental entities are also considered.

All of the source treatment materials and services needed for implementation are readily available. The logistics of implementation increase in difficulty as more treatment components are added in each alternative. The ability to construct and operate the source treatment would be moderately difficult, due to the location of a portion of the groundwater VOC source being under the Erection Bay.

The components necessary for the groundwater pump and treat are currently in place (for the On-Property Plume) or are readily available (for the Off-Property Plume). Operation and maintenance of the air strippers would include cleaning and replacement of well components and maintenance of blower equipment. Under Alternatives 3 and 3A, the discontinuation of the current extraction and air stripping system is not anticipated to be difficult.

The construction of the Off-Property Groundwater Plumes pump and treat system would be difficult, due to coordination with railroad, water, street, sewer and other utilities, as well as the presence of six road crossings.

Cost

The estimated present worth costs for the alternatives, not including the No Action alternative, range from $1.3 million for Alternative 3 to $3.9 million for Alternative 4A. Cost summaries can be found in Table 2.21.

Support Agency Acceptance

The U.S. EPA has expressed its support for Alternatives 4 and 4B. The U.S. EPA does not believe that Alternative 1 (the No Action Alternative) provides adequate protection of human health and the environment.

Community Acceptance

Community acceptance addresses the public's general response to the remedial alternatives and the proposed plan. This ROD includes a responsiveness summary that presents public comments and the Illinois EPA responses to those comments. Acceptance of the recommended alternative is evaluated after the public comment period. The public comment period was from March 19, 2004 through May 24, 2004. A complete summary of public comments can be found in the Section 3 of this ROD.

2.10 PRINCIPAL THREAT WASTE

The NCP establishes an expectation that treatment will be used to address the principal threats posed by a site, wherever practicable (NCP §300.430(a)(1)(iii)(A)). Principal threat wastes that pose unacceptable risk to human health and the environment at the site include sources such as the VOC contaminated soil and, to a lesser extent, the highly contaminated groundwater at the Erection Bay source area. Contaminated groundwater is not generally considered to be a source material; however, non-aqueous phase liquid (NAPLs) in groundwater may be viewed as source material. Although NAPLs have not been identified at the Erection Bay source area, concentrations of tetrachloroethene (PCE) in groundwater in excess of 4,000 µg/L suggest the possible presence of residual NAPL. Similar levels of VOC contaminants have been persistent at this location, despite the implementation of the pump and treat system. These contaminants present a significant risk to human health if exposure should occur and they are an ongoing source of contamination, due to their mobility in the

subsurface. Alternatives 3, 3A, 4, and 4A address the principal threat waste by in-situ chemical oxidation. Alternative 4B addresses the source material with dual-phase extraction and treatment by air stripping.

2.11 SELECTED REMEDY

Based on information collected and developed in the RI/FS, and the comparative analysis of alternatives as described previously, Alternative 4 meets the remedial action objectives at the least cost (other than the No Further Action alternative). Alternative 4 is the most appropriate final remedial action for addressing contamination at the Beloit Corporation Superfund Site.

The nine evaluation criteria served as the basis for conducting the screening and detailed analysis of the alternatives. The chosen remedy provides the best balance of tradeoffs with respect to the balancing and modifying criteria. Alternative 4 provides the best option for providing an appropriate level of containment and long-term overall protection of human health and the environment.

Description of the Selected Remedy

The selected remedy may change during the remedial design and construction process. Any necessary changes to the remedy described herein will be documented by a technical memorandum in the Administrative Record, an Explanation of Significant Differences (ESD) or a ROD amendment. The selected remedy includes the following measures.

Groundwater VOC Source Area and the On-Property Groundwater Plumes

Continued operation of the ISCA pump and treat groundwater control system on the Beloit Property. This measure includes the operation and maintenance of the existing extraction wells and the air-stripper unit. The discharge of treated water to the Rock River (under a NPDES permit) would continue under the existing permit. This measure also includes the continuation of quarterly groundwater monitoring of and reporting on the operation of the on-site and off-site monitoring wells.

Institution of a restrictive covenant that prohibits the use of groundwater on-site for potable purposes. A restrictive covenant, prohibiting shallow groundwater withdrawal for potable use until drinking water standards (the more stringent of either the MCLs or Illinois Class I groundwater standards) are attained would be placed on the Beloit Corporation property affected by the shallow groundwater plume. A consent order negotiated for the performance of the remedial design/remedial action (RD/RA) would include the groundwater use restriction. The consent order would specifically state that the use restriction would be enforceable by means of the consent decree.

Other controls such as site security fences, zoning restrictions, and adherence to local ordinances restricting groundwater use would also be used to restrict access to the site and the contaminated groundwater.

Establishment of a Groundwater Management Zone (GMZ) for the On-Property Plumes. A GMZ is a three-dimensional region containing groundwater being managed to mitigate impairment caused by the release of contaminants from a site. Pursuant to 35 IAC 620.250, the groundwater management must continue as approved by the Illinois EPA for the GMZ to remain in effect. Once it is confirmed that the groundwater remedy has been completed and the groundwater quality standards applicable to the class of groundwater have been achieved, the GMZ will expire. If concentrations specified in 35 IAC 620.450(a)(4)(B) will remain in the groundwater after the completion of the remedy, the Illinois EPA will review the adequacy of controls and site management at least once every five years.

Implementation of in-situ treatment measures for the source area of the On-Property Groundwater Plume. For purposes of this ROD, chemical oxidation is the option selected for treatment of soil and groundwater at the Erection Bay source area. Details of the implementation of the full-scale treatment would be based on the results of bench-scale and pilot scale tests to be carried out during the remedial design phase of the remedy process. For cost estimating purposes, it was assumed that chemical oxidation would be carried out by using a modified Fenton's reagent. The modified Fenton's Reagent process is an in-situ remedial treatment technology that destroys organic contamination through co-existing chemical oxidation and reduction. This process consists of injecting patented chelated iron catalysts and hydrogen peroxide into the contaminated aquifer. Residual hydrogen peroxide decomposes into water and oxygen in the subsurface and any remaining iron precipitates out. This process has a history of application in waste treatment fields. However, other reagents may be tested and utilized. The selection would be based on which method would most effectively achieve the remedial action objectives (RAOs) at the desired cost. Five subsurface injections of oxidizing reagents would be completed over a five-month period. It is estimated that eighteen injection points to a depth of fifty feet would be required to treat the identified source area. Approximately 100 tons of drill-cutting soils would have to be removed. These materials are assumed to be non-hazardous and will be hauled to a landfill approximately twenty miles from the site. The performance of the in-situ treatment measures would be monitored by monthly VOC analysis of ten monitoring wells during the treatment period. This would then be followed by quarterly VOC analysis of the wells for the following year.

Quarterly monitoring of the On-Property Groundwater Plume through existing and new monitoring wells for VOCs would also be included as part of the On-Property Groundwater Plume source treatment and control measures. This monitoring would also measure the progress of the treatment and control measures employed. Quarterly groundwater monitoring would be a continuation of the current sampling and analysis of the existing on-property and off-property groundwater monitoring wells.

Off-Property Groundwater Plume

Potential action in the Blackhawk Acres subdivision to control exposure to COC at the homes in Blackhawk Acres Subdivision with VOCs above applicable MCLs or Illinois Class I groundwater standards. The need for an action would be based on the results of

five years of continued groundwater monitoring. Current data show COC to be declining. In one residential case, COCs concentrations are already below MCLs and Illinois Class I groundwater standards. Therefore, the current point-of-entry treatment systems would be maintained for five years. If after five years of residential well monitoring, the VOC concentrations are not below the MCLs or Illinois Class I groundwater standards (or expected to reach the MCLs or Illinois Class I groundwater standards in a short time), an alternate control action could be provided. These alternate control actions, if necessary, may include providing an alternative water supply (i.e., municipal water supply or providing/reconfiguring carbon treatment systems, etc.) and extending the ISCA pump and treat system into the nearby Blackhawk Acres subdivision to control this portion of the groundwater plume. If residential wells show VOCs attributable to the site at or above MCLs or Illinois Class I groundwater standards and receive correspondence from Illinois Department of Public Health recommending homeowners seek an alternate water supply, an immediate alternate control action (i.e., provision for municipal water supply or carbon treatment systems) may be implemented under the contingency plan. For purposes of this ROD, the additional cost for the extension of the current groundwater extraction and treatment system into the Blackhawk Subdivision has been calculated and is included in the cost for the selected alternative.

Establishment of a Groundwater Management Zone. As described for the On-Property Plume, a GMZ would be established for that portion of the Off-Property Plume that extends into the Village of Rockton. The GMZ would also include the southern portion of the Blackhawk Acres subdivision.

Monitored Natural Attenuation of groundwater. To remediate groundwater contamination and insure compliance with Illinois EPA groundwater regulations, two remediation components would be implemented. These components include natural attenuation (through the establishment of a GMZ in the Village of Rockton) and continued monitoring. The establishment of a GMZ would allow for the natural attenuation of the contaminated groundwater by a variety of physical, chemical and biological processes that act without human intervention to reduce the mass or concentration of contaminants in groundwater as it flows through the GMZ towards the Rock River. Because the concentrations of groundwater contamination are declining (based on results from previous and on-going quarterly monitoring), it is believed that the groundwater cleanup objectives can be attained through natural remediation measures without directly treating the groundwater, within a time frame that is reasonable (see Figure 5), as compared to active measures.

Groundwater monitoring would be included as part of the measures for the Off-Property Groundwater Plumes. The groundwater monitoring program details would be refined during the Remedial Design stage. The objective of the monitoring program would be to assess progress toward the attainment of groundwater ARARs by monitored natural attenuation. Eleven off-property wells would be sampled for VOCs annually and an annual report would summarize the results. This monitoring program may or may not include wells that are part of the quarterly groundwater monitoring program discussed under the On-Property Plume. The monitored natural attenuation would be considered effective if groundwater contaminant

levels continue to decrease at approximately the existing rate, without resulting in a further degradation of overall groundwater quality.

If through this monitoring, COC attributable to the NPL site are detected in private wells located south or east of the Beloit Corporation property, the IDPH will be notified. The IDPH will determine if risk levels are being exceeded and may recommend the potential need for an alternate water supply. If and alternate water supply is recommended, Illinois EPA and U.S.EPA will take appropriate actions under the contingency plan. Such actions may include the connection of the residences to the municipal water system or the installation and operation of point-of-entry treatment systems for these private wells. Illinois EPA and U.S.EPA will make a determination of the appropriate course of action on an individual basis, as necessary. There are a total of 77 potable water wells in the Village and in the Blackhawk Acres subdivision. In the event that one or more of the private wells in either the Blackhawk Acres subdivision or the Village becomes affected by one of the VOC plumes, a contingency capital cost of $20,000 should be added for each well that needs to be connected to the municipal water supply. A contingency of $1,540,000 for each remedial alternative should therefore be considered. These costs are not included in the net present worth costs for the alternatives, due to their uncertainty

This alternative assumes a project life of 15 years. This assumed project life is based on the removal of the source of VOCs in the source area groundwater (i.e., the PCE in the groundwater at the Erection Bay) and the use of the existing ISCA groundwater pump and treat system to further remove VOCs from the groundwater. These actions, as well as the potential extension of the ISCA treatment system into the Blackhawk Acres Subdivision, would be expected to enhance and accelerate the trend towards declining VOC concentrations in the groundwater downgradient of the source area. The actual remedial timeframe for this alternative may be more or less than 15 years, depending upon the effectiveness of the actions implemented through this alternative.

Triggers During Groundwater Monitoring Period. After the active remediation is complete the monitoring wells will be sampled on a quarterly basis, at least initially. If any of the following "triggers" occur, all parties will be notified, and they will determine if any action needs to be taken:

- Contaminant concentrations in groundwater exhibit an increasing trend.
- Near-source wells exhibit large increases in concentrations.
- Contaminants are identified in monitoring wells outside the original plume.
- Contaminant concentrations are not decreasing at a rate sufficient to meet the remedial objectives.

The mechanisms for addressing these issues will be developed in the Operation and Maintenance Plan for the site.

Estimated Remedy Costs

A detailed breakdown of the cost estimate for the selected alternative is provided in Table 2.22. The cost estimates are based on the best available information about the anticipated scope of the remedial alternative. Changes in the cost elements are likely to occur as new information and data are collected during the engineering design of the remedial alternative. Major changes may be documented in the form of a memorandum in the Administrative Record file, an ESD, or a ROD amendment. This is an order-of-magnitude engineering cost estimate that is expected to be within +50 to – 30 percent of the actual project cost.

Selected Remedy Estimated Cost:

Capital - $1,123,000
Annual O&M - $92,000
Present Worth - $2,024,000
Duration of O&M – 15 Years
Total Present Value (7% Discount Rate) - $2,627,000
Estimated Time to Construct – 1 Year

Expected Outcomes of the Selected Remedy

The expected land use, groundwater use, anticipated socio-economic and community impacts and anticipated environmental and ecological benefits of the selected remedy are as follows:

Land Use. After this site is remediated, it is anticipated that the land for the Beloit property will be used for commercial and industrial activities, based on current zoning ordinances and the ongoing usefulness of the existing buildings. After cleanup levels are achieved, unrestricted land use could be considered if restrictive covenants are lifted and if zoning ordinances were changed.

Groundwater Use. Institutional controls will be implemented at the Beloit property to ensure that potable water supply wells are not installed in the shallow aquifer at the site until groundwater is restored. Groundwater is expected to reach MCLs or State of Illinois Class I groundwater standards as a result of the removal of the contaminant source and continuation of the ISCA pump and treat system. Present use of groundwater on the property is from a deeper aquifer source not affected by the VOC contamination. This groundwater can continue to be used.

In the Village of Rockton, current ordinances prevent the installation of potable wells within the boundaries of the village municipal water distribution system. The municipal well nearest the Off-Property Plume has not been affected by the plume and is not expected to be impacted, due to its side-gradient location relative to the plume. In addition, the capture zone for this well does not encompass any portion of the plume and extends in a different direction relative to the direction of flow of the plume. Ongoing monitoring and contingency plans will ensure that no exposure occurs as the concentrations of VOCs in the plume decrease to below MCLs or Illinois Class I groundwater standards due to natural attenuation. When the On-

Property Plume remediation is complete, groundwater in the Village is expected to meet Class I standards and further monitoring will not be required.

In the Blackhawk Acres subdivision, point-of-entry carbon filtration units will remain in place until the initial five-year review period. Based on current decreasing VOC concentration trends, it is expected that these filtration units may not be required in another five years. However, ongoing monitoring will be required until the remedy for the On-Property Plume is complete. When the On-Property Plume is remediated (estimated in 15 years), unrestricted shallow groundwater use is anticipated for the Blackhawk Acres subdivision.

Anticipated Community Impacts and Environmental and Ecological Benefit. Groundwater within the NPL site and the Village of Rockton will be returned to unrestricted beneficial use.

Cleanup Levels for the Selected Remedy

The purpose of this response action is to control risks posed by ingestion and domestic use of contaminated groundwater and to minimize migration of contaminants in groundwater. The results of the FS and BLRA indicate that federal and state ARARs (i.e., MCLs and Illinois Class I groundwater standards) are exceeded and that existing conditions at the site pose a potential future excess lifetime cancer risk greater than 1×10^{-4} from ingestion of VOC contaminated groundwater. This risk relates to the 1,1-DCE, 1,2-DCA, carbon tetrachloride, TCE, and PCE concentrations in groundwater. This remedy will address all groundwater contaminated with VOCs in excess of the MCLs or Class I standards shown in Table 2.23. Treatment will be monitored to ensure that cleanup levels are achieved. Groundwater is expected to be available for unrestricted use as a result of the remedy.

2.12 STATUTORY DETERMINATIONS

The selected remedy must satisfy the requirements of Section 121(d)(2) of CERCLA to:

- Protect human health and the environment;
- Comply with ARARs;
- Be cost-effective;
- Utilize permanent solutions and alternate treatment technologies to the maximum extent practicable; and,
- Satisfy a preference for treatment as a principal element of the remedy.

The implementation of the selected alternative at the Beloit Corporation Superfund Site satisfies the requirements of CERCLA as detailed below.

Protection of Human Health and the Environment

Continuation of the ISCA pump and treat system will prevent further migration of the On-Property Plume to off-site residential wells in the Blackhawk Acres subdivision or in the

Village of Rockton, and will ultimately result in the reduction of contamination in the On-Property Plume to levels below MCLs and Class I standards, thereby reducing the potential health risks to future groundwater users. Treatment of the source area on Beloit property (the Erection Bay area) will minimize the remediation timeframe. Institutional controls (restrictive covenants) will protect against the uncontrolled use of groundwater until the cleanup objectives of the remedy are achieved. Ongoing monitoring and contingency plans for the Off-Property Plumes will provide protection against unanticipated exposures to contaminated groundwater in the Village of Rockton and in the Blackhawk Acres subdivision. Ongoing use and evaluation of the need for point-of-entry carbon filtration systems at residences in the Blackhawk Acres subdivision will ensure that current groundwater users are not exposed to groundwater with VOC concentrations in excess of MCLs and Class I standards. There are no short-term threats associated with the selected remedy that cannot be readily controlled. In addition, no adverse cross-media impacts are expected for the selected remedy.

Compliance with ARARs

Section 121(d) of CERCLA requires that Superfund remedial actions meet ARARs. In addition to ARARs, the analysis that was conducted for this remedial action considered guidelines, criteria and standards useful in evaluating remedial alternatives. These guidelines, criteria and standards are known as material to be considered, or TBCs. In contrast to ARARs, that are promulgated cleanup standards, standards of control, substantive environmental protection requirements, criteria and/or limitations, (TBCs) are guidelines and other criteria that have not been promulgated. ARARs are categorized as follows:

- Chemical-Specific ARARs involve ambient or chemical-specific requirements that establish acceptable values or concentrations of a chemical that may be found in, or discharged to, the environment and that are protective of human health and the environment.

- Location-specific ARARs establish restrictions on the management of waste or hazardous substances in specific protected locations, such as wetlands, floodplains, historic places, and sensitive habitats. No location specific ARARs are involved at this site for the selected remedy.

- Action-specific ARARs are technology-based or activity-based requirements or limitations on actions taken with respect to remediation. These requirements are triggered by particular remedial activities that are selected to accomplish the remedial objectives. The action-specific ARARs indicate the way in which the selected alternative must be implemented as well as specify levels for discharge. These ARARs establish controls or restrictions on particular kinds of activities related to the management of hazardous substances, pollutants, or contaminants.

The Illinois EPA has determined that the selected remedy will comply with the ARARs and the TBCs listed in Table 2.20. The table provides a citation and description of the ARARs

considered for the site and an evaluation of the applicability, relevance and appropriateness off each ARAR to the selected remedy.

Cost Effectiveness

In the Illinois EPA's judgment, the selected remedy is cost-effective and represents a reasonable value for the money to be spent. In making this determination, the following definition was used: "A remedy shall be cost-effective if its costs are proportional to its overall effectiveness." (NCP§300.430(f)(1)(ii)(D)). This was accomplished by evaluating the "overall effectiveness" of those alternatives that satisfied the threshold criteria (i.e., were both protective of human health and the environment and ARAR-compliant). Overall effectiveness was evaluated by assessing three of the five balancing criteria in combination (long-term effectiveness and permanence; reduction in toxicity, mobility, and volume through treatment; and short-term effectiveness). Overall effectiveness of this remedial alternative was determined to be proportional to its costs and hence this alternative represents a reasonable value for the money spent.

Utilization of Permanent Solutions and Alternative Treatment Technologies to the Maximum Extent Practicable

The Illinois EPA has determined that the selected remedy represents the maximum extent to which permanent solutions and treatment technologies can be utilized in a practicable manner at the site. Of those alternatives that are protective of human health and the environment and comply with ARARs, the Illinois EPA has determined that the selected remedy provides the best balance of tradeoffs in terms of the nine criteria, while also considering the statutory preference for treatment as a principal element and bias against off-site treatment and disposal and considering state and community acceptance.

The selected remedy does not present short-term risks different from the other treatment alternatives. There are no special implementability issues.

Preference for Treatment as a Principal Element

The selected remedy includes treatment as a principal element. The selected remedy removes the materials constituting principal threats at the site by treatment with chemical oxidation. The selected remedy also includes water treatment by pumping contaminated water from the On-Property Plume, and then treating the water on site. The selected remedy is the most reliable and cost-effective alternative considered.

Five-Year Review Requirements

Because this remedy will result in hazardous substances, pollutants or contaminants remaining on-site above levels that allow for unlimited use and unrestricted exposure, a statutory review will be conducted within five years after initiation of the remedial action to ensure that the remedy continues to be protective of human health and the environment.

2.13 DOCUMENTATION OF SIGNIFICANT CHANGES FROM PREFERRED ALTERNATIVE OF PROPOSED PLAN

There were no significant changes in the selected remedy from the preferred alternative outlined in the Proposed Plan.

Table 2.1
SITE MODEL OF POTENTIALLY COMPLETE EXPOSURE PATHWAYS
BELOIT CORPORATION NPL SITE

Pathways and Exposure Routes	Residents on the NPL Site (Children and Adults)	Recreational Users of Rock River and Trespassers on Beloit Property (Nearby Resident Children)	Beloit Corporation Employees	Construction Workers Working *on the Beloit* Corporation Property
Groundwater				
Inhalation	X	---	---	---
Ingestion	X	---	---	---
Dermal Contact	X	---	---	---
Surface Water – Adjacent to Beloit Corp. Property				
Inhalation	---	---	---	---
Ingestion	---	---	---	---
Dermal Contact	---	---	---	---
Surface Water – At Point of Groundwater Discharge to Rock River				
Inhalation	---	---	---	---
Ingestion	X	X	---	---
Dermal Contact	X	X	---	---
Sediment – Adjacent to Beloit Corp. Property				
Inhalation	---	---	---	---
Ingestion	---	X	---	---
Dermal Contact	---	X	---	---
Sediment – At Point of Groundwater Discharge to Rock River				
Inhalation	---	---	---	---
Dermal Contact	---	---	---	---
Ingestion	---	---	---	---
Soils on the Beloit Property				
Inhalation	---	---	X	X
Dermal Contact	---	X	X	X
Ingestion	---	X	X	X
Air on the NPL Site				
Fugitive Vapor Inhalation	---	---	X	X
Indoor Vapor Inhalation	---	---	---	---
Dust Inhalation	---	---	X	X
Food				
Locally grown food ingestion	---	---	---	---
Wild game ingestion	---	---	---	---
Fish ingestion	---	---	---	---

General Notes:

1. "---" = Pathway is considered incomplete or insignificant from a public health perspective for this population, and is therefore addressed qualitatively within the BLRA (Montgomery Watson, 2000). See Section 5.2 of the BLRA for further details concerning why the exposure pathway was considered incomplete or insignificant.
2. X = Pathway is considered potentially complete for this population and is quantitatively evaluated in the BLRA. See Section 5.2 of the BLRA for further details concerning why the exposure pathway was considered complete.

Table 2.2
Chemicals of Potential Concern by Medium and Area
Beloit Corporation - Blackhawk Facility
Rockford, Illinois

	Investigation Media/Area											
								Private Wells				
COPC	On-Site All depths	On-Site surface	On-Site 0-10 ft	Off-Site All depths	Off-Site surface	Sediment Maximum	Monitoring Wells (9)	All Wells	PW1	PW2	PW3	PW4
Chloromethane							X	X				X
Methylene chloride								X				X
Acetone	X	X	X			X						
Carbon disulfide				X			X					
1,1-Dichloroethene							X	X	X			
1,1-Dichloroethane	X						X	X		X		X
1,2-Dichloroethene (cis)							X					
Chloroform				X				X			X	
1,2-Dichloroethane							X					
2-Butanone	X			X		X						
1,1,1-Trichloroethane	X						X	X	X	X		X
Carbon tetrachloride												
Trichloroethene							X	X		X		X
Benzene				X								
4-Methyl-2-pentanone				X								
2-Hexanone	X			X								
Tetrachloroethene	X	X	X				X	X	X			X
Toluene	X	X	X	X								
Ethylbenzene	X		X			X						
Xylenes (mixed)	X		X			X						
Dichlorodifluoromethane							X					X
Phenol	X						X					
1,4-Dichlorobenzene								X				X
2-Methylphenol	X											
4-Methylphenol	X					X						
2,4-Dimethylphenol	X											
Naphthalene	X		X			X						
2-Methylnaphthalene	X					X						
Dimethylphthalate							X					
Acenaphthylene						X						
Acenaphthene	X	X	X			X						
4-Nitrophenol	X	X	X									
Dibenzofuran	X	X	X			X						
Diethylphthalate							X					
Fluorene	X	X	X			X						
Phenanthrene	X	X	X	X	X	X						
Anthracene	X	X	X	X	X	X						
Di-n-butylphthalate				X	X	X	X					
Fluoranthene	X	X	X	X	X	X						
Pyrene	X	X	X	X	X	X						
Butylbenzylphthalate				X	X							
Benzo(a)anthracene	X	X	X	X	X	X						
Chrysene	X	X	X	X	X	X						
bis(2-ethylhexyl)phthalate	X	X	X	X	X							
Di-n-octyl Phthalate	X	X	X									
Benzo(b)fluoranthene	X	X	X	X	X	X						
Benzo(k)fluoranthene	X	X	X	X	X	X						
Benzo(a)pyrene	X	X	X	X	X	X						

Table 2.2
Chemicals of Potential Concern by Medium and Area
Beloit Corporation - Blackhawk Facility
Rockford, Illinois

	Investigation Media/Area											
								Private Wells				
COPC	On-Site All depths	On-Site surface	On-Site 0-10 ft	Off-Site All depths	Off-Site surface	Sediment Maximum	Monitoring Wells (9)	All Wells	PW1	PW2	PW3	PW4
Indeno(1,2,3-cd)pyrene	X	X	X	X	X	X						
Dibenz(a,h)anthracene	X	X	X	X	X	X						
Benzo(g,h,i)perylene	X	X	X	X	X	X						
Carbazole	X	X	X									
Heptachlor	X						X					
Aldrin	X	X	X									
4,4'-DDT	X	X	X									
Methoxychlor	X											
Endrin ketone	X											
PCB	X	X	X									
Endrin Aldehyde							X					
Aluminum	X	X	X	X	X	X	X					
Antimony	X	X	X	X	X							
Arsenic	X	X	X	X	X	X	X					
Barium	X	X	X	X	X	X	X					
Beryllium	X	X	X									
Cadmium (water)							X					
Cadmium (food/soil)	X	X	X	X	X	X						
Chromium III	X		X									
Chromium VI	X	X		X	X	X	X					
Cobalt	X	X	X	X	X	X	X					
Copper	X	X	X	X	X	X	X					
Lead	X	X	X	X	X	X	X					
Manganese	X	X	X	X	X	X	X					
Mercury	X	X	X	X	X	X	X					
Nickel	X	X	X	X	X	X	X					
Selenium	X	X	X			X	X					
Silver	X	X	X	X	X							
Thallium						X						
Vanadium	X	X	X	X	X	X						
Zinc	X	X	X	X	X	X	X					
Cyanide	X	X	X				X					

Footnotes:

1. PW1 = private wells with no point of use treatment system (Hypothetical) for specific Southern Blackhawk Subdivision Residents that have had point of use treatment systems installed by the IEPA.

2. PW2 = private wells with no point of use treatment system (Hypothetical) for specific Eastern Blackhawk Subdivision Residents that have had point of use treatment systems installed by the IEPA.

3. PW3 = private wells with no point of use treatment system for specific Northern Blackhawk Subdivision Residents that do not have point-of-use groundwater treatment systems, and have chloroform affected groundwater.

4. PW4. Other private wells with no point of use treatment systems for specific Blackhawk Subdivision Residents that do not have point-of-use groundwater treatment systems. 112 Blackhawk is currently the only other well showing detects of organic analytes

5. All depths - Compound in all the soil samples above the water table.

6. 0 to 10 ft - Compound in soil samples from the 0 to 10 ft interval only.

7. Surface - Compound in surface samples only (0-1 ft).

8 Essential nutrients are not included as COPCs (Ca, Mg, Na, Fe, K)

9 VOCs considered COPCs in monitoring wells were considered potentially COPCs in Rock River surface water south of the Village of Rockton where the plume discharges to the River.

Table 2.3

Summary of Chemical of Concern and Medium-Specific Exposure Point Concentration

Scenario Timeframe: Current and Hypothetical Future
Medium: Soil
Exposure Medium: Surface Soil (0 to 1 foot Depth)

Exposure Point	Chemical of Concern	Concentration Detected		Units	Frequency of Detection	Exposure Point Concentration	Exposure Point Concentration Units	Statistical Measure
		Minimum	Maximum					
Surface Soil	Acetone	0.067	0.089	mg/kg	2/24	0.089	mg/kg	Max Detect
Surface Soil	Tetrachloroethene	0.004	0.008	mg/kg	2/24	0.008	mg/kg	Max Detect
Surface Soil	Toluene	0.002	0.006	mg/kg	2/24	0.006	mg/kg	Max Detect
Surface Soil	Acenaphthene	0.099	0.23	mg/kg	3/24	0.23	mg/kg	Max Detect
Surface Soil	4-Nitrophenol	0.099	0.1	mg/kg	2/24	0.1	mg/kg	Max Detect
Surface Soil	Dibenzofuran	0.06	0.095	mg/kg	2/24	0.095	mg/kg	Max Detect
Surface Soil	Fluorene	0.059	0.19	mg/kg	3/24	0.19	mg/kg	Max Detect
Surface Soil	Phenanthrene	0.058	1.6	mg/kg	7/24	1.6	mg/kg	Max Detect
Surface Soil	Anthracene	0.069	0.46	mg/kg	4/24	0.46	mg/kg	Max Detect
Surface Soil	Fluoranthene	0.045	2.5	mg/kg	10/24	2.5	mg/kg	Max Detect
Surface Soil	Pyrene	0.04	1.8	mg/kg	10/24	1.8	mg/kg	Max Detect
Surface Soil	Benzo(a)anthracene	0.038	1 R	mg/kg	8/24	1	mg/kg	Max Detect
Surface Soil	Chrysene	0.041	1.4	mg/kg	10/24	1.4	mg/kg	Max Detect
Surface Soil	bis(2-ethylhexyl)phthalate	0.043	0.21	mg/kg	7/24	0.21	mg/kg	Max Detect
Surface Soil	Di-n-octyl Phthalate	0.074	0.15	mg/kg	3/24	0.15	mg/kg	Max Detect
Surface Soil	Benzo(b)fluoranthene	0.047	1.7 R	mg/kg	7/24	1.7	mg/kg	Max Detect
Surface Soil	Benzo(k)fluoranthene	0.052	1.7	mg/kg	8/24	1.7	mg/kg	Max Detect
Surface Soil	Benzo(a)pyrene	0.046	1 J	mg/kg	8/24	1	mg/kg	Max Detect
Surface Soil	Indeno(1,2,3-cd)pyrene	0.15	0.7	mg/kg	7/24	0.7	mg/kg	Max Detect
Surface Soil	Dibenz(a,h)anthracene	0.11 R	0.11 R	mg/kg	1/24	0.11	mg/kg	Max Detect
Surface Soil	Benzo(g,h,i)perylene	0.17	0.77	mg/kg	6/24	0.77	mg/kg	Max Detect
Surface Soil	Carbazole	0.14	0.19	mg/kg	3/24	0.19	mg/kg	Max Detect
Surface Soil	Aldrin	0.0018	0.0018	mg/kg	1/24	0.0018	mg/kg	Max Detect
Surface Soil	4,4'-DDT	0.0023	0.0032	mg/kg	2/24	0.0032	mg/kg	Max Detect
Surface Soil	Aroclor-1248	0.024	0.024	mg/kg	1/24	0.36	mg/kg	Max Detect
Surface Soil	Aroclor-1254	0.039	0.36 R	mg/kg	6/24	0.36	mg/kg	Max Detect

Table 2.3

Summary of Chemical of *Concern and Medium-Specific* Exposure Point Concentration

Scenario Timeframe: *Current* and Hypothetical Future
Medium: *Soil*
Exposure Medium: Surface Soil (0 to 1 foot Depth)

Exposure Point	Chemical of Concern	Concentration Detected		Units	Frequency of Detection	Exposure Point Concentration	Exposure Point Concentration Units	Statistical Measure
		Minimum	Maximum					
Surface Soil	Aroclor-1260	0.011	0.042	mg/kg	3/24	0.36	mg/kg	Max Detect
Surface Soil	Aluminum	496	12900	mg/kg	24/24	12900	mg/kg	Max Detect
Surface Soil	Antimony	7.8	8.7	mg/kg	2/11	8.7	mg/kg	Max Detect
Surface Soil	Arsenic	0.45 R	5.1	mg/kg	24/24	5.1	mg/kg	Max Detect
Surface Soil	Barium	6	128	mg/kg	24/24	128	mg/kg	Max Detect
Surface Soil	Beryllium	0.21	0.62	mg/kg	15/24	0.62	mg/kg	Max Detect
Surface Soil	Cadmium	0.56	4.3	mg/kg	10/24	4.3	mg/kg	Max Detect
Surface Soil	Chromium, total	1.9	73.4	mg/kg	24/24	73.4	mg/kg	Max Detect
Surface Soil	Cobalt	1.6	8.1	mg/kg	23/24	8.1	mg/kg	Max Detect
Surface Soil	Copper	5.5	1550	mg/kg	23/24	1550	mg/kg	Max Detect
Surface Soil	Lead	5.1	827	mg/kg	24/24	827	mg/kg	Max Detect
Surface Soil	Manganese	198	681	mg/kg	24/24	681	mg/kg	Max Detect
Surface Soil	Mercury	0.16	0.39	mg/kg	5/24	0.39	mg/kg	Max Detect
Surface Soil	Nickel	6.4	65.9	mg/kg	14/24	65.9	mg/kg	Max Detect
Surface Soil	Selenium	0.26	0.71	mg/kg	7/24	0.71	mg/kg	Max Detect
Surface Soil	Silver	2.9	2.9	mg/kg	1/24	2.9	mg/kg	Max Detect
Surface Soil	Vanadium	3.8	36.5	mg/kg	22/24	36.5	mg/kg	Max Detect
Surface Soil	Zinc	19.7	130	mg/kg	24/24	130	mg/kg	Max Detect
Surface Soil	Cyanide	0.62	0.94	mg/kg	5/24	0.94	mg/kg	Max Detect

Key

mg/Kg Milligrams per kilogram.
a Maximum detected concentration

This scenario assesses risk posed to a *current* trespasser and Beloit Corporation Employee, and a hypothetical future Beloit Corporation Employee from exposure to surface soil at the site.

Table 2.4

Summary of Chemical of Concern and Medium-Specific Exposure Point Concentration

Scenario Timeframe: Current Construction Worker
Medium: Soil
Exposure Medium: Soil (0 to 10 feet)

Exposure Point	Chemical of Concern	Concentration Detected		Units	Frequency of Detection	Exposure Point Concentration	Exposure Point Concentration Units	Statistical Measure
		Minimum	Maximum					
Soil	Acetone	0.067	0.089	mg/kg	2/24	0.089	mg/kg	Max 0-10 ft.*
Soil	Tetrachloroethene	0.001	0.433	mg/kg	17/70	0.008	mg/kg	Max 0-10 ft.*
Soil	Toluene	0.001	0.006	mg/kg	3/70	0.006	mg/kg	Max 0-10 ft.*
Soil	Ethylbenzene	0.008	0.008	mg/kg	1/46	0.008	mg/kg	Max 0-10 ft.*
Soil	Xylenes (total)	0.25	0.25	mg/kg	1/46	0.25	mg/kg	Max 0-10 ft.*
Soil	Naphthalene	0.062	3.1	mg/kg	4/34	0.075	mg/kg	Max 0-10 ft.*
Soil	4-Nitrophenol	0.099	0.1	mg/kg	2/24	0.1	mg/kg	Max 0-10 ft.*
Soil	Acenaphthene	0.15	3.5	mg/kg	8/59	0.7	mg/kg	Max 0-10 ft.*
Soil	Dibenzofuran	0.066	1.4	mg/kg	7/59	0.19	mg/kg	Max 0-10 ft.*
Soil	Fluorene	0.13	2.5	mg/kg	8/59	0.38	mg/kg	Max 0-10 ft.*
Soil	Phenanthrene	0.057	27	mg/kg	15/59	1.6	mg/kg	Max 0-10 ft.*
Soil	Anthracene	0.25	4.8	mg/kg	9/59	0.46	mg/kg	Max 0-10 ft.*
Soil	Fluoranthene	0.038	57	mg/kg	21/59	2.5	mg/kg	Max 0-10 ft.*
Soil	Pyrene	0.039	51	mg/kg	19/59	1.8	mg/kg	Max 0-10 ft.*
Soil	Benzo(a)anthracene	0.036	56 J	mg/kg	15/59	1	mg/kg	Max 0-10 ft.*
Soil	Chrysene	0.037	54	mg/kg	17/59	1.4	mg/kg	Max 0-10 ft.*
Soil	bis(2-ethylhexyl)phthalate	0.064	2.1	mg/kg	13/58	0.55	mg/kg	Max 0-10 ft.*
Soil	Di-n-octyl Phthalate	0.074	0.15	mg/kg	3/24	0.15	mg/kg	Max 0-10 ft.*
Soil	Benzo(b)fluoranthene	0.042	130 J	mg/kg	15/59	1.7	mg/kg	Max 0-10 ft.*
Soil	Benzo(k)fluoranthene	0.045	130 J	mg/kg	15/59	1.7	mg/kg	Max 0-10 ft.*
Soil	Benzo(a)pyrene	0.046	57 J	mg/kg	14/59	1	mg/kg	Max 0-10 ft.*
Soil	Indeno(1,2,3-cd)pyrene	0.48	57 J	mg/kg	11/59	0.78	mg/kg	Max 0-10 ft.*
Soil	Dibenz(a,h)anthracene	0.14 R	9.2 J	mg/kg	4/58	0.11	mg/kg	Max 0-10 ft.*
Soil	Benzo(g,h,i)perylene	0.26	73	mg/kg	10/59	0.83	mg/kg	Max 0-10 ft.*
Soil	Carbazole	0.11	2.5	mg/kg	8/59	0.19	mg/kg	Max 0-10 ft.*
Soil	Aldrin	0.0018	0.0018	mg/kg	1/24	0.0018	mg/kg	Max 0-10 ft.*
Soil	4,4'-DDT	0.0023	0.0041	mg/kg	6/69	0.0032	mg/kg	Max 0-10 ft.*
Soil	Aroclor-1248	0.024	0.024	mg/kg	1/24	0.36	mg/kg	Max 0-10 ft.*

Table 2.4

Summary of Chemical of Concern and Medium-Specific Exposure Point Concentration

Scenario Timeframe: Current Construction Worker
Medium: Soil
Exposure Medium: Soil (0 to 10 feet)

Exposure Point	Chemical of Concern	Concentration Detected		Units	Frequency of Detection	Exposure Point Concentration	Exposure Point Concentration Units	Statistical Measure
		Minimum	Maximum					
Soil	Aroclor-1254	0.039	0.36 R	mg/kg	6/24	0.36	mg/kg	Max 0-10 ft.[a]
Soil	Aroclor-1260	0.011	0.042	mg/kg	3/24	0.36	mg/kg	Max 0-10 ft.[a]
Soil	Aluminum	496	12900	mg/kg	69/69	12900	mg/kg	Max 0-10 ft.[a]
Soil	Antimony	7.8	11.8	mg/kg	1/46	11.8	mg/kg	Max 0-10 ft.[a]
Soil	Arsenic	0.45 R	10.71	mg/kg	64/69	5.1	mg/kg	Max 0-10 ft.[a]
Soil	Barium	5	128	mg/kg	69/69	128	mg/kg	Max 0-10 ft.[a]
Soil	Beryllium	0.1	1.1	mg/kg	25/69	1.1	mg/kg	Max 0-10 ft.[a]
Soil	Cadmium	0.56	11.5	mg/kg	30/69	4.3	mg/kg	Max 0-10 ft.[a]
Soil	Chromium, total	1.9	100	mg/kg	69/69	73.4	mg/kg	Max 0-10 ft.[a]
Soil	Cobalt	1.5	16.8	mg/kg	56/69	8.1	mg/kg	Max 0-10 ft.[a]
Soil	Copper	3.1	1550	mg/kg	65/69	1550	mg/kg	Max 0-10 ft.[a]
Soil	Iron	2340	51000 R	mg/kg	69/69	17400	mg/kg	Max 0-10 ft.[a]
Soil	Lead	1.1	827	mg/kg	69/69	827	mg/kg	Max 0-10 ft.[a]
Soil	Manganese	52.2	1400	mg/kg	69/69	681	mg/kg	Max 0-10 ft.[a]
Soil	Mercury	0.04	0.66	mg/kg	13/69	0.39	mg/kg	Max 0-10 ft.[a]
Soil	Nickel	4.7	268	mg/kg	33/69	65.9	mg/kg	Max 0-10 ft.[a]
Soil	Selenium	0.26	0.71	mg/kg	8/50	0.71	mg/kg	Max 0-10 ft.[a]
Soil	Silver	2.1	2.9	mg/kg	9/69	2.9	mg/kg	Max 0-10 ft.[a]
Soil	Vanadium	2.9	36.5	mg/kg	53/69	36.5	mg/kg	Max 0-10 ft.[a]
Soil	Zinc	8.2	311	mg/kg	53/69	130	mg/kg	Max 0-10 ft.[a]
Soil	Cyanide	0.62	0.94	mg/kg	5/24	0.94	mg/kg	Max 0-10 ft.[a]

Key

mg/Kg Milligrams per kilogram.

a Maximum detected concenration of samples within 0-10 feet below ground surface.

This scenario assesses risk posed to a construction worker exposed to surface and subsurface soil at the site.

Table 2.5

Summary of Chemicals of Concern and Medium-Specific Exposure Point Concentration

Scenario Timeframe: **Future On-Site Resident**
Medium: **Groundwater**
Exposure Medium: **Groundwater**

Exposure Point	Chemical of Concern	Concentration Detected		Units	Frequency of Detection	Exposure Point Concentration	Exposure Point Concentration Units	Statistical Measure
		Minimum	Maximum					
Shallow Aquifer Tap Water	Chloromethane	11	81	ug/l	3/112	81	ug/L	Max Detect[a]
Shallow Aquifer Tap Water	Carbon disulfide	2	2	ug/L	1/112	2	ug/L	Max Detect[a]
Shallow Aquifer Tap Water	1,1-Dichloroethene	1	26	ug/l	12/112	26	ug/L	Max Detect[a]
Shallow Aquifer Tap Water	1,1-Dichloroethane	1	15	ug/l	8/112	15	ug/L	Max Detect[a]
Shallow Aquifer Tap Water	1,2-Dichloroethene (total)	2	480	ug/L	9/112	480	ug/L	Max Detect[a]
Shallow Aquifer Tap Water	1,2-Dichloroethane	320	320	ug/L	1/112	320	ug/L	Max Detect[a]
Shallow Aquifer Tap Water	1,1,1-Trichloroethane	2	160	ug/L	41/112	160	ug/L	Max Detect[a]
Shallow Aquifer Tap Water	Carbon tetrachloride	3	3	ug/L	1/112	3	ug/L	Max Detect[a]
Shallow Aquifer Tap Water	Trichloroethene	1	160	ug/L	31/112	160	ug/L	Max Detect[a]
Shallow Aquifer Tap Water	Tetrachloroethene	3	4300	ug/L	32/112	4300	ug/L	Max Detect[a]
Shallow Aquifer Tap Water	Phenol	2	2	ug/L	1/48	2	ug/L	Max Detect[a]
Shallow Aquifer Tap Water	Dimethylphthalate	1	1	ug/L	1/48	1	ug/L	Max Detect[a]
Shallow Aquifer Tap Water	Diethylphthalate	1	2	ug/L	3/48	2	ug/L	Max Detect[a]
Shallow Aquifer Tap Water	Di-n-butylphthalate	1	1	ug/L	2/48	1	ug/L	Max Detect[a]
Shallow Aquifer Tap Water	Heptachlor	0.16	0.16	ug/L	1/52	0.16	ug/L	Max Detect[a]
Shallow Aquifer Tap Water	Endrin aldehyde	0.002	0.005	ug/L	6/52	0.005	ug/L	Max Detect[a]
Shallow Aquifer Tap Water	Aluminum	60.7	126	ug/L	3/48	126	ug/L	Max Detect[a]
Shallow Aquifer Tap Water	Arsenic	2.3	2.3	ug/L	1/48	2.5	ug/L	Max Detect[a]
Shallow Aquifer Tap Water	Barium	13	229	ug/L	48/48	229	ug/L	Max Detect[a]
Shallow Aquifer Tap Water	Cadmium	2.4	5.8	ug/L	5/48	5.8	ug/L	Max Detect[a]
Shallow Aquifer Tap Water	Chromium, total	15	15	ug/L	1/48	15	ug/L	Max Detect[a]

Table 2.5

Summary of Chemicals of Concern and Medium-Specific Exposure Point Concentration

Scenario Timeframe: **Future On-Site Resident**
Medium: **Groundwater**
Exposure Medium: **Groundwater**

Exposure Point	Chemical of Concern	Concentration Detected		Units	Frequency of Detection	Exposure Point Concentration	Exposure Point Concentration Units	Statistical Measure
		Minimum	Maximum					
Shallow Aquifer Tap Water	Cobalt	4.9	4.9	ug/L	1/48	4.9	ug/L	Max Detect[a]
Shallow Aquifer Tap Water	Copper	2.9	15	ug/l	8/48	15	ug/L	Max Detect[a]
Shallow Aquifer Tap Water	Lead	3.4	3.4	ug/l	1/48	3.4	ug/L	Max Detect[a]
Shallow Aquifer Tap Water	Manganese	13	334	ug/l	27/48	367	ug/L	Max Detect[a]
Shallow Aquifer Tap Water	Mercury	0.32	0.32	ug/l	1/48	0.32	ug/L	Max Detect[a]
Shallow Aquifer Tap Water	Nickel	8.6	877	ug/L	12/48	877	ug/L	Max Detect[a]
Shallow Aquifer Tap Water	Zinc	1.8	46.7	ug/l	8/48	46.7	ug/L	Max Detect[a]
Shallow Aquifer Tap Water	Cyanide	8	9	ug/l	2/48	9	ug/L	Max Detect[a]

Key

ug/L = micrograms per liter

a Maximum detected concentration of each chemical detected in monitoring wells on-site during the RI

This scenario assesses risk posed to a hyptothetical future site resident using groundwater from the shallow aquifer on the Beloit Corporation property as a drinking water source.

Table 2.6

Summary of Chemicals of Concern and Medium-Specific Exposure Point Concentration

Scenario Timeframe: Current **Resident Blackhawk Acres Subdivision**
Medium: Groundwater
Exposure Medium: Groundwater

Exposure Point	Chemical of Concern	Concentration Detected		Units	Frequency of Detection	Exposure Point Concentration	Exposure Point Concentration Units	Statistical Measure
		Minimum	Maximum					
Tap water	1,1-Dichloroethene	1	3	ug/L	3/56	1.8	ug/L	Average[a]
Tap water	1,1,1-Trichloroethane	0.5	25	ug/L	8/56	16.3	ug/L	Average[a]
Tap water	Tetrachloroethene	0.5	86	ug/L	7/56	49.5	ug/L	Average[a]

Key

a Average concentration of well where maximum detected concentration of chemical was detected

ug/L = micrograms per liter

This scenario was used to assess risks to a Southern Blackhawk Acres Subdivision resident if no point-of-use groundwater treatment system were in place.

Table 2.7

Summary of Chemicals of Concern and Medium-Specific Exposure Point Concentration

Scenario Timeframe: **Current Resident Blackhawk Acres Subdivision**
Medium: **Groundwater**
Exposure Medium: **Groundwater**

Exposure Point	Chemical of Concern	Concentration Detected		Units	Frequency of Detection	Exposure Point Concentration	Exposure Point Concentration Units	Statistical Measure
		Minimum	Maximum					
Tap water	1,1-Dichloroethane	0.6	3	ug/L	4/56	1.8	ug/L	Average[a]
Tap water	1,1,1-Trichloroethane	0.5	25	ug/L	8/56	8	ug/L	Average[a]
Tap water	Trichloroethene	0.5	14	ug/L	5/56	11.9	ug/L	Average[a]

Key

a Average concentration of well where maximum detected concentration of chemical was detected.

ug/L = micrograms per liter

This scenario was used to assess risks to a Eastern Blackhawk Acres Subdivision resident if no point-of-use groundwater treatment system were in place.

Table 2.8

Summary of Chemical of Concern and Medium-Specific Exposure Point Concentration

Scenario Timeframe: Current **Resident Blackhawk Acres Subdivision**
Medium: Groundwater
Exposure Medium: Groundwater

Exposure Point	Chemical of Concern	Concentration Detected		Units	Frequency of Detection	Exposure Point Concentration	Exposure Point Concentration Units	Statistical Measure
		Minimum	Maximum					
Tap water	Chloroform	0.6	14	ug/L	8/56	12	ug/L	Average[a]

Key

a Average concentration of well where maximum detected concentration of chloroform was detected.

ug/L = micrograms per liter

This scenario was used to assess risks to Northern Blackhawk Acres Subdivision residents that do not have a point-of-use groundwater treatment system in place, and have chloroform impacted groundwater.

Table 2.9

Summary of Chemicals of Concern and Medium-Specific Exposure Point Concentration

Scenario Timeframe: **Current Resident Blackhawk Acres Subdivision**
Medium: **Groundwater**
Exposure Medium: **Groundwater**

Exposure Point	Chemical of Concern	Concentration Detected		Units	Frequency of Detection	Exposure Point Concentration	Exposure Point Concentration Units	Statistical Measure
		Minimum	Maximum					
Tap water	Chloromethane	0.9	0.9	ug/L	1/68	0.9	ug/L	Maximum[a]
Tap water	Methylene chloride	0.5	0.5	ug/L	1/68	0.5	ug/L	Maximum[a]
Tap water	1,1-Dichloroethane	0.6	0.7	ug/L	3/69	0.7	ug/L	Maximum[a]
Tap water	1,1,1-Trichloroethane	0.5	2	ug/L	9/77	2	ug/L	Maximum[a]
Tap water	Trichloroethene	0.5	4	ug/L	6/77	4	ug/L	Maximum[a]
Tap water	Tetrachloroethene	0.5	4.2	ug/L	9/77	4.2	ug/L	Maximum[a]
Tap water	Dichlorodifluoromethane	0.9	14	ug/L	3/69	14	ug/L	Maximum[a]
Tap water	1,4-Dichlorobenzene	0.6	0.6	ug/L	1/68	0.6	ug/L	Maximum[a]

Key

a Maximum concentration of chemical detected in any other private well not having a point-of-use treatment system.

ug/L = micrograms per liter

This scenario was used to assess risks for other Blackhawk Acres Subdivision residents that do not have a no point-of-use groundwater treatment system in place.

Table 2.10

Summary of Chemicals of Concern and Medium-Specific Exposure Point Concentration

Scenario Timeframe: Current Recreational User
Medium: Groundwater
Exposure Medium: Surface water

Exposure Point	Chemical of Concern	Exposure Point Concentration	Exposure Point Concentration Units	Statistical Measure
Rock River surface water	1,1-Dichloroethene	1.20E-06	mg/L	Max Detect[a]
Rock River surface water	1,1-Dichloroethane	7.00E-07	mg/L	Max Detect[a]
Rock River surface water	1,2-Dichloroethene (cis)	1.00E-07	mg/L	Max Detect[a]
Rock River surface water	1,1,1-Trichloroethane	7.10E-06	mg/L	Max Detect[a]
Rock River surface water	Trichloroethene	6.00E-06	mg/L	Max Detect[a]
Rock River surface water	Tetrachloroethene	2.20E-10	mg/L	Max Detect[a]

Key

mg/L = milligrams per liter
ug/L = micrograms per liter
a Modeled concentration based on maximum detected concentration of Well W47C, groundwater discharge estimates, and Rock River flow data.

This scenario assesses risk posed to a recreational user swimming in the Rock River.

Table 2.11

Summary of Chemical of Concern and Medium-Specific Exposure Point Concentration

Scenario Timeframe: Current Recreational User
Medium: Sediment
Exposure Medium: Rock River Sediment

Exposure Point	Chemical of Concern	Concentration Detected		Units	Frequency of Detection	Exposure Point Concentration	Exposure Point Concentration Units	Statistical Measure
		Minimum	Maximum					
Rock River Sediment	Acetone	0.018	0.16	mg/Kg	5/11	0.16	mg/Kg	Max detected[a]
Rock River Sediment	2-Butanone	0.004	0.036	mg/Kg	3/11	0.036	mg/Kg	Max detected[a]
Rock River Sediment	Ethylbenzene	0.15	0.15	mg/Kg	1/11	0.15	mg/Kg	Max detected[a]
Rock River Sediment	Xylenes (total)	0.11	0.11	mg/Kg	1/11	0.11	mg/Kg	Max detected[a]
Rock River Sediment	4-Methylphenol	0.11	0.11	mg/Kg	1/11	0.11	mg/Kg	Max detected[a]
Rock River Sediment	Naphthalene	24	24	mg/Kg	1/11	24	mg/Kg	Max detected[a]
Rock River Sediment	2-Methylnaphthalene	48	48	mg/Kg	1/11	48	mg/Kg	Max detected[a]
Rock River Sediment	Acenaphthylene	0.14	7.6	mg/Kg	2/11	7.6	mg/Kg	Max detected[a]
Rock River Sediment	Acenaphthene	40	40	mg/Kg	1/11	40	mg/Kg	Max detected[a]
Rock River Sediment	Dibenzofuran	7.4	7.4	mg/Kg	1/11	7.4	mg/Kg	Max detected[a]
Rock River Sediment	Fluorene	0.046	27	mg/Kg	2/11	27	mg/Kg	Max detected[a]
Rock River Sediment	Phenanthrene	0.28	100	mg/Kg	2/11	100	mg/Kg	Max detected[a]
Rock River Sediment	Anthracene	0.23	42	mg/Kg	2/11	42	mg/Kg	Max detected[a]
Rock River Sediment	Di-n-butylphthalate	0.31	0.31	mg/Kg	1/11	0.31	mg/Kg	Max detected[a]
Rock River Sediment	Fluoranthene	0.052	64	mg/Kg	5/11	64	mg/Kg	Max detected[a]
Rock River Sediment	Pyrene	0.07	84	mg/Kg	5/11	84	mg/Kg	Max detected[a]
Rock River Sediment	Benzo(a)anthracene	0.06	38 I	mg/Kg	3/11	38	mg/Kg	Max detected[a]
Rock River Sediment	Chrysene	0.06	35	mg/Kg	3/11	35	mg/Kg	Max detected[a]
Rock River Sediment	Benzo(b)fluoranthene	0.23	20 I	mg/Kg	2/11	20	mg/Kg	Max detected[a]
Rock River Sediment	Benzo(k)fluoranthene	0.36	17 R	mg/Kg	2/11	17	mg/Kg	Max detected[a]
Rock River Sediment	Benzo(a)pyrene	0.075	30 I	mg/Kg	3/11	30	mg/Kg	Max detected[a]
Rock River Sediment	Indeno(1,2,3-cd)pyrene	0.18	10 I	mg/Kg	2/11	10	mg/Kg	Max detected[a]
Rock River Sediment	Dibenz(a,h)anthracene	0.086	5.6 I	mg/Kg	2/11	5.6	mg/Kg	Max detected[a]

Table 2.11

Summary of Chemical of Concern and Medium-Specific Exposure Point Concentration

Scenario Timeframe: Current Recreational User
Medium: Sediment
Exposure Medium: Rock River Sediment

Exposure Point	Chemical of Concern	Concentration Detected		Units	Frequency of Detection	Exposure Point Concentration	Exposure Point Concentration Units	Statistical Measure
		Minimum	Maximum					
Rock River Sediment	Benzo(g,h,i)perylene	0.041	12	mg/Kg	3/11	12	mg/Kg	Max detected[a]
Rock River Sediment	Aluminum	1150	10600	mg/Kg	11/11	10600	mg/Kg	Max detected[a]
Rock River Sediment	Arsenic	0.48 R	7.3	mg/Kg	11/11	7.3	mg/Kg	Max detected[a]
Rock River Sediment	Barium	6.9	166	mg/Kg	11/11	166	mg/Kg	Max detected[a]
Rock River Sediment	Cadmium	1.2	3.9	mg/Kg	7/11	3.9	mg/Kg	Max detected[a]
Rock River Sediment	Chromium, total	3.6	17.5	mg/Kg	10/11	17.5	mg/Kg	Max detected[a]
Rock River Sediment	Cobalt	2.9	8.6	mg/Kg	9/11	8.6	mg/Kg	Max detected[a]
Rock River Sediment	Copper	3.4	40.6	mg/Kg	9/11	40.6	mg/Kg	Max detected[a]
Rock River Sediment	Iron	3430	20000	mg/Kg	11/11	20000	mg/Kg	Max detected[a]
Rock River Sediment	Lead	1.6	94	mg/Kg	11/11	94	mg/Kg	Max detected[a]
Rock River Sediment	Manganese	53.5	728	mg/Kg	11/11	728	mg/Kg	Max detected[a]
Rock River Sediment	Mercury	0.05	4.1	mg/Kg	9/11	4.1	mg/Kg	Max detected[a]
Rock River Sediment	Nickel	5.5	18.8	mg/Kg	8/11	18.8	mg/Kg	Max detected[a]
Rock River Sediment	Selenium	0.54	0.85	mg/Kg	2/11	0.85	mg/Kg	Max detected[a]
Rock River Sediment	Thallium	0.15	0.44	mg/Kg	8/11	0.44	mg/Kg	Max detected[a]
Rock River Sediment	Vanadium	13.9	22.1	mg/Kg	5/11	22.1	mg/Kg	Max detected[a]
Rock River Sediment	Zinc	7.6	156	mg/Kg	11/11	156	mg/Kg	Max detected[a]

Key

mg/Kg Milligrams per kilogram.

a Maximum concenration of downstream samples

This scenario was used to assess risks to a recreational user swimming in the Rock River.

Table 2.12

Cancer Toxicity Data Summary

Pathway: Ingestion, Dermal

Chemical of Concern	Oral Cancer Slope Factor	Dermal Cancer Slope Factor	Slope Factor Units	Weight of Evidence/Cancer Guideline Description	Source	Date (YYYY)
Chloromethane	0.013	0.026	kg-day/mg	–	HEAST	1997
1,1-Dichloroethene	0.6	0.6	kg-day/mg	–	IRIS	2000
Chloroform	0.0061	0.012	kg-day/mg	B2	IRIS	2000
1,2-Dichloroethane	0.091	0.091	kg-day/mg	–	IRIS	2000
Carbon tetrachloride	0.13	0.26	kg-day/mg	–	IRIS	2000
Trichloroethene	0.011	0.011	kg-day/mg	NC	NCEA	NA
Benzene	0.029	0.032	kg-day/mg	–	IRIS	2000
Tetrachloroethene	0.052	0.052	kg-day/mg	NC	NCEA	NA
1,4-Dichlorobenzene	0.024	0.024	kg-day/mg	--	HEAST	NA
Benzo(a)anthracene	0.73	NA	kg-day/mg	--	Extrapolated[b]	NA
Chrysene	0.0073	NA	kg-day/mg	--	Extrapolated[b]	NA
bis(2-ethylhexyl)phthalate	0.014	0.056	kg-day/mg	--	IRIS	2000
Benzo(b)fluoranthene	0.73	NA	kg-day/mg	--	Extrapolated[b]	NA
Benzo(k)fluoranthene	0.073	NA	kg-day/mg	--	Extrapolated[b]	NA
Benzo(a)pyrene	7.3	NA	kg-day/mg	B2	IRIS	2000
Indeno(1,2,3-cd)pyrene	0.73	NA	kg-day/mg	--	Extrapolated[b]	NA
Dibenz(a,h)anthracene	7.3	NA	kg-day/mg	--	Extrapolated[b]	NA
Carbazole	0.02	NA	kg-day/mg	--	HEAST	NA
Heptachlor	4.5	9	kg-day/mg	--	IRIS	2000
Aldrin	17	34	kg-day/mg	--	IRIS	2000
4,4'-DDT	0.34	0.68	kg-day/mg	--	IRIS	2000
PCB	7.7	26	kg-day/mg	--	IRIS	2000
Arsenic	1.5	1.5	kg-day/mg	A	IRIS	2000
Beryllium	4.3	86	kg-day/mg	--	IRIS	2000
Cadmium (water)	ND	ND	kg-day/mg	--	IRIS	2000
Cadmium (food/soil)	ND	ND	kg-day/mg	--	IRIS	2000
Chromium VI	ND	ND	kg-day/mg	D	IRIS	NA

Pathway: Inhalation

Chemical of Concern	Inhalation Cancer Slope Factor	Units	Weight of Evidence/Cancer Guideline Description	Source	Date (YYYY)
Chloromethane	0.0063	kg-day/mg	A	HEAST	1997
1,1-Dichloroethene	0.18	kg-day/mg	–	IRIS[a]	2000
Chloroform	0.081	kg-day/mg	–	IRIS	2000
1,2-Dichloroethane	0.091	kg-day/mg	–	IRIS[a]	2000
Carbon tetrachloride	0.053	kg-day/mg	–	HEAST	1997
Trichloroethene	0.006	kg-day/mg	–	NCEA	NA
Benzene	0.029	kg-day/mg	–	IRIS[a]	2000
Tetrachloroethene	0.002	kg-day/mg	–	NCEA	NA
Benzo(a)anthracene	0.61	kg-day/mg	–	Extrapolated[b]	NA
Chrysene	0.0061	kg-day/mg	–	Extrapolated[b]	NA
Benzo(b)fluoranthene	0.61	kg-day/mg	–	Extrapolated[b]	NA
Benzo(k)fluoranthene	0.061	kg-day/mg	–	Extrapolated[b]	NA
Benzo(a)pyrene	6.1	kg-day/mg	–	Extrapolated[b]	NA
Indeno(1,2,3-cd)pyrene	0.61	kg-day/mg	–	Extrapolated[b]	NA
Dibenz(a,h)anthracene	6.1	kg-day/mg	–	Extrapolated[b]	NA
Heptachlor	4.5	kg-day/mg	--	HEAST	1997
Aldrin	17	kg-day/mg	–	IRIS	2000
4,4'-DDT	0.34	kg-day/mg	–	IRIS	2000
Arsenic	15	kg-day/mg	A	IRIS[a]	2000
Beryllium	8.4	kg-day/mg	B1	IRIS	2000
Cadmium (food/soil)	6.3	kg-day/mg	B1	IRIS[a]	2000
Chromium VI	42	kg-day/mg	A	IRIS[a]	2000

Key

[a] Values converted from unit risk to dose.

[b] Slope factor developed using benzo(a)pyrene and relative potency factors

-- Information not presented in BLRA

NA Not applicable

ND No data [illegible] HEAST

Table 2.13

Non-Cancer Toxicity Data Summary

Pathway: **Ingestion, Dermal, Inhalation**

Chemical of Concern	Subchronic Oral RfD Value	Note	Chronic Oral RfD Value	Note	Subchronic Dermal RfD	Chronic Dermal RfD	Subchronic Inhalation RfD	Note	Chronic Inhalation RfD	Note
Chloromethane	ND	H	ND	Ha	ND	ND	2.6	Eu	ND	Ha
Acetone	1	H	0.1	I	1	0.1	ND		ND	
Carbon disulfide	0.1	H	0.1	I	0.05	0.05	0.2	Ius	0.2	Iu
1,1-Dichloroethene	0.009	H	0.009	I	0.009	0.009	ND		ND	
1,1-Dichloroethane	1	H	0.1	Ha	1	0.1	14	H	0.14	Ha
1,2-Dichloroethene (cis)	0.1		0.01		0.1	0.01	ND		ND	
Chloroform	0.01	H	0.01	I	ND	0.005	ND		ND	
1,2-Dichloroethane	ND		ND		ND	ND	ND		0.0029	
2-Butanone	2	H3	0.6	I	1	0.3	2.9	H3	0.29	Iu
1,1,1-Trichloroethane	0.9	H3	0.09	Ib	0.9	0.09	2.9	H3	0.29	Eu
Carbon tetrachloride	ND		0.0007	I	ND	0.00035	ND		0.00057	E
Trichloroethene	ND		0.006	a	ND	0.006	ND		ND	a
Benzene	ND		ND	a	ND	ND	1.6	Eu	0.0017	a
4-Methyl-2-pentanone	0.8	H	0.08	H	0.4	0.04	0.23	H	0.023	Ha
2-Hexanone	ND		0.08	H	ND	0.04	ND		0.023	Ha
Tetrachloroethene	0.1	H	0.01	I	0.1	0.01	ND		ND	
Toluene	2	H	0.2	I	2	0.2	0.29	Eu	0.11	Iu
Ethylbenzene	0.1	E	0.1	I	0.092	0.092	0.29	Eu	0.29	Iu
Xylenes (mixed)	4	H3	2	I	3.7	1.8	0.086	H3	0.086	H3
Dichlorodifluoromethane	0.9	H	0.2	I	0.45	0.1	2	Hu	0.2	Hu
Phenol	0.6	H	0.6	I	0.59	0.59	ND		ND	I
1,4-Dichlorobenzene	ND		ND		ND	ND	0.71	Hu	0.23	Iu
2-Methylphenol	0.5	H	0.05	I	0.4	0.04	ND		ND	Ic
4-Methylphenol	0.005	H	0.005	H	0.004	0.004	ND		ND	d
2,4-Dimethylphenol	0.2	H	0.02	I	0.1	0.01	ND		ND	
Naphthalene	0.04	E	0.04	E	0.034	0.034	ND		ND	
2-Methylnaphthalene	ND		ND		ND	ND	ND		ND	
Dimethylphthalate	ND		ND		ND	ND	ND		ND	
Acenaphthylene	0.04		0.04		0.02	0.02	ND		ND	D
Acenaphthene	0.6	H	0.06	I	0.3	0.03	ND		ND	
4-Nitrophenol	ND		ND		ND	ND	ND		ND	
Dibenzofuran	ND		ND		ND	ND	ND		ND	d
Diethylphthalate	8	H	0.8	I	4	0.4	ND		ND	
Fluorene	0.4	H	0.04	I	0.2	0.02	ND		ND	
Phenanthrene	0.04		0.04		0.02	0.02	ND		ND	D

Table 2.13

Non-Cancer Toxicity Data Summary

Pathway: Ingestion, Dermal, Inhalation

Chemical of Concern	Subchronic Oral RfD Value	Note	Chronic Oral RfD Value	Note	Subchronic Dermal RfD	Chronic Dermal RfD	Subchronic Inhalation RfD	Note	Chronic Inhalation RfD	Note
Anthracene	3	H	0.3	I	1.5	0.15	ND		ND	
Di-n-butylphthalate	1	H	0.1	I	0.9	0.09	ND		ND	c
Fluoranthene	0.4	H	0.04	I	0.2	0.02	ND		ND	
Pyrene	0.3	H	0.03	I	0.15	0.015	ND		ND	
Butylbenzylphthalate	2	H	0.2	I	1.8	0.18	ND		ND	
Benzo(a)anthracene	ND		ND		ND	ND	ND		ND	
Chrysene	ND		ND		ND	ND	ND		ND	d
bis(2-ethylhexyl)phthalate	0.02	H	0.02	I	0.005	0.005	0.057	Eu	ND	
Di-n-octyl Phthalate	0.02	H	0.02	Ha	0.01	0.01	ND		ND	
Benzo(b)fluoranthene	ND		ND		ND	ND	ND		ND	
Benzo(k)fluoranthene	ND		ND		ND	ND	ND		ND	
Benzo(a)pyrene	ND		ND		ND	ND	ND		ND	
Indeno(1,2,3-cd)pyrene	ND		ND		ND	ND	ND		ND	
Dibenz(a,h)anthracene	ND		ND		ND	ND	ND		ND	
Benzo(g,h,i)perylene	0.04		0.04		0.02	0.02	ND		ND	
Carbazole	ND		ND		ND	ND	ND		ND	
Heptachlor	0.0005	H	0.0005	I	0.00025	0.00025	ND		ND	
Aldrin	0.00003	H	0.00003	I		0.000015	ND		ND	
4,4'-DDT	0.0005	H	0.0005	I	ND	0.00025	ND		ND	
Methoxychlor	0.005	H	0.005	I	ND	0.0025	ND		ND	
Endrin ketone	0.0003	H	0.0003	I	0.00015	0.00015	ND		ND	
PCB	ND		ND		ND	ND	ND		ND	
Endrin Aldehyde	0.0003	H	0.0003	I	0.00015	0.00015	ND		ND	
Aluminum	ND	d	1		ND	0.05	ND	d	ND	d
Antimony	0.0004	H	0.0004	I	0.000004	0.000004	ND		ND	
Arsenic	0.0003	H	0.0003	I	0.0003	0.0003	ND		ND	
Barium	0.07	H	0.07	I	0.0035	0.0035	0.0014	Hu	0.00014	Hau
Beryllium	0.005	H	0.005	I	0.00025	0.00025	ND		ND	
Cadmium (water)	ND		0.0005	I	ND	0.000035	ND		ND	a
Cadmium (food/soil)	ND		0.001	I	ND	0.00007	ND		ND	a
Calcium	ND		ND		ND	ND	ND		ND	
Chromium VI	0.02	H	0.005	I	0.0022	0.00055	0.00002	H3	0.000002	H3
Cobalt	ND		0.06		ND	0.058	ND		ND	
Copper	0.037	H	0.037	d	0.036	0.036	ND		ND	
Iron	ND	d	ND	d	ND	ND	ND	d	ND	d

Table 2.13

Non-Cancer Toxicity Data Summary

Pathway: Ingestion, Dermal, Inhalation

Chemical of Concern	Subchronic Oral RfD Value	Note	Chronic Oral RfD Value	Note	Subchronic Dermal RfD	Chronic Dermal RfD	Subchronic Inhalation RfD	Note	Chronic Inhalation RfD	Note
Lead	NR		NR		NR	NR	ND		ND	
Magnesium	ND		ND		ND	ND	ND		ND	
Manganese	0.14	H	0.14	I	0.0042	0.0042	0.00011	Hu	0.000014	Iu
Mercury	0.0003	H	0.0003	Ha	0.000045	0.000045	0.000086	Hu	0.000086	Hau
Nickel	0.02	H	0.02	I	0.002	0.002	ND		ND	a
Potassium	ND		ND		ND	ND	ND		ND	
Selenium	0.005	H	0.005	I	0.0049	0.0049	ND		ND	
Silver	0.005	H	0.005	I	0.0005	0.0005	ND		ND	
Sodium	ND		ND		ND	ND	ND		ND	
Thallium	0.0008	H	0.00008	I	0.0008	0.00008	ND		ND	
Vanadium	0.007	H	0.007	H	0.00007	0.00007	ND		ND	
Zinc	0.3	H	0.3	I	0.09	0.09	ND		ND	
Cyanide	0.02	H	0.02	I	0.0034	0.0034	ND		ND	

Notes:

Toxicity values were obtained from the U.S.EPA's Integrated Risk Information System (IRIS) (searched January 2000) and U.S.EPA's "Health Assessment Summary Tables" (HEAST) FY 1997. When a value was not available in IRIS or HEAST, provisional values were used as referenced in the U.S.EPA Region 3 Risk-Based Concentration Table (download January 2000). Both subchronic and chronic reference doses are presented for the noncarcinogenic effects of a chemical. Subchronic reference doses are used to represent the toxic potency of a chemical if the duration of exposure is less than seven years. Chronic reference doses are used to represent the toxic potency of a chemical when the exposure duration is greater than seven years.

Key:

a = Under review in IRIS - value shown is from HEAST
d = Data inadequate for quantitative assessment per HEAST
s = Chronic value used as a conservative surrogate for subchronic value
3 = Pre 1994 HEAST value used because no value is listed in IRIS, 1994 HEAST, or from NCEA.
E = Provisional value from NCEA as referenced in the USEPA Region 3 Risk-Based Concentration Table.
H = HEAST
I = IRIS
u = Value converted from unit risk to dose.
5 = Slope factor developed using benzo(a)pyrene and relative potency factors
NA = Not applicable.
ND = No data found in IRIS or HEAST

Table 2.14

Risk Characterization Summary - Carcinogens

Scenario Timeframe: **Current**
Receptor Population: **Southern Blackhawk Acres Residents**
Receptor Age: **Integrated**

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Carcinogenic Risk			
				Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Groundwater	Tap	1,1-Dichloroethene	2.8E-07	1.5E-05	1.0E-4	1.1E-04
			Tetrachloroethene	2.2E-06	3.6E-05	4.6E-06	4.3E-05
						Groundwater risk total =	**1.6E-04**

This table summarizes the potential risks for residences in the Southern Blackhawk Acres Subdivision area if point-of-use groundwater treatment systems were not installed.

Table 2.15

Risk Characterization Summary - Carcinogens

Scenario Timeframe: Future
Receptor Population: Hypothetical Rockton Resident
Receptor Age: Integrated

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Carcinogenic Risk			
				Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Groundwater	Tap	1,1-Dichloroethene	2.5E-05	1.7E-04	4.6E-07	1.9E-04
			Carbon tetrachloride	5.4E-06	7.3E-06	ND	1.3E-05
			Trichloroethene	2.8E-05	5.0E-05	5.1E-7	7.8E-05
						Groundwater risk total =	**2.8E-04**

This scenario summarizes risks for residences of the Village of Rockton that obtain their drinking water from private wells, assuming that their wells become contaminated in the future.

Table 2.16

Contribution of Vapor Intrusion Pathway to Total Risk for Selected COCs

Chemical of Concern	Maximum Detected Concentration In Water Table Wells (µg/L)	Estimated Incremental Excess Cancer Risk			Percent Risk Due To Vapor Intrusion
		Vapor Intrusion[a,c]	All Other Pathways[b]	Total Risk	
Blackhawk Acres Subdivision					
1,1-Dichloroethene	3	1.80E-06	1.10E-04	1.10E-04	1.60%
Tetrachloroethene	140	4.20E-07	4.30E-05	4.30E-05	1%
Village of Rockton					
1,1-Dichloroethene	3	1.80E-06	1.90E-04	1.90E-04	0.90%
Carbon Tetrachloride	3	4.90E-07	1.30E-05	1.30E-05	3.60%
Trichloroethene	180	1.10E-06	7.80E-05	7.90E-05	1.40%

[a] Vapor Intrusion Modeling conducted using USEPA *Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils* GW-SCREEN.XLS.

[b] All other pathways include ingestion, inhalation of vapors from household water usage, and dermal exposure during showering/bathing.

[c] Vapor intrusion risks were estimated based on a depth to the water table of 25 feet, and soil physical parameters for sandy soil.

Table 2.17

Risk Characterization Summary - Carcinogens

Scenario Timeframe: **Future**
Receptor Population: **Hypothetical On-Site Resident**
Receptor Age: **Integrated**

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Carcinogenic Risk			
				Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Groundwater	Tap	Chloromethane	1.5E-05	2.4E-05	6.2E-08	3.8E-05
			1,1-Dichloroethene	2.2E-04	1.4E-3	4.0E-06	1.7E-03
			1,2-Dichloroethane	4.1E-04	1.3E-03	2.3E-06	1.8E-03
			Carbon tetrachloride	5.4E-06	7.3E-06	ND	1.3E-05
			Trichloroethene	2.5E-05	4.4E-05	4.5E-07	6.9E-05
			Tetrachloroethene	3.1E-03	4.0E-04	1.9E-04	3.7E-03
			Heptachlor	1.0E-5	1.7E-05	ND	2.7E-05
			Arsenic	5.2E-05	ND	1.2E-07	5.2E-05
						Groundwater risk total =	**7.3E-03**

This table summarizes the potential risks for hypothetical residences if groundwater from the shallow aquifer on the Beloit Corporation property was used as a drinking water source.

Table 2.18

Risk Characterization Summary - Non-Carcinogens

Scenario Timeframe: Future
Receptor Population: Resident on Beloit Corporation Property
Receptor Age: Age-Integrated

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Non-Carcinogenic Hazard Quotient			
				Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Groundwater	Tap	Chloromethane	ND	0.1	ND	0.1
			Carbon disulfide	0.00065	0.0011	0.000018	0.0017
			1,1-Dichloroethene	0.094	ND	0.0017	0.096
			1,1-Dichloroethane	0.0049	0.011	0.000048	0.016
			1,2-Dichloroethene (cis)	1.6	ND	0.018	1.6
			1,2-Dichloroethane	0.35	25	0.002	25
			1,1,1-Trichloroethane	0.26	0.06	0.0051	0.33
			Carbon tetrachloride	0.14	0.57	ND	0.71
			Trichloroethene	0.87	ND	0.016	0.88
			Tetrachloroethene	14	3.3	0.85	18
			Phenol	0.00011	ND	0.00000065	0.00011
			Dimethylphthalate	ND	ND	ND	ND
			Diethylphthalate	0.000081	ND	0.00000047	0.000082
			Di-n-butylphthalate	0.00033	ND	0.000015	0.00034
			Heptachlor	0.01	ND	ND	0.01
			Endrin Aldehyde	0.00054	ND	0.00001	0.00055
			Aluminum	0.0041	ND	0.000094	0.0042
			Arsenic	0.27	ND	0.00062	0.27
			Barium	0.11	ND	0.0035	0.11
			Cadmium (water)	0.38	ND	0.035	0.41
			Chromium VI	0.16	ND	0.015	0.18
			Cobalt	0.0027	ND	0.0000024	0.0027
			Copper	0.013	ND	0.0001	0.013
			Lead	ND	ND	ND	ND
			Manganese	0.085	ND	0.0049	0.09
			Mercury	0.035	ND	0.00008	0.035
			Nickel	1.4	ND	0.0082	1.4
			Selenium	0.072	ND	0.00016	0.072
			Zinc	0.0051	ND	0.000007	0.0051
			Cyanide	0.015	ND	0.000034	0.015
						Receptor Hazard Index Total =	**49**

Key

ND = Not Determined because a reference dose is not available.

TABLE 2.19
Detailed Analysis of Alternatives
Beloit Corporation, Rockton Facility
Rockton, Illinois

CRITERIA	ALTERNATIVE 1 No Action - includes discontinuation of the current remedial system	ALTERNATIVE 2A On-Property Groundwater Pump & Treat	ALTERNATIVE 2B On-Property Groundwater Pump & Treat and Off-Property Groundwater Plumes Monitored Attenuation	ALTERNATIVE 3A Groundwater VOC Treatment and Off-Property Groundwater Plumes	ALTERNATIVE 3B On-Property Groundwater Pump & Treat, VOC Source Treatment (Oxidation) and Off-Property Plumes Monitored Attenuation	ALTERNATIVE 4A On-Property Groundwater Pump & Treat, VOC Source Treatment (Dual Phase) and Off-Property Plumes Monitored Attenuation	ALTERNATIVE 4B On-Property Groundwater Pump & Treat, VOC Source Treatment (Dual Phase) and Off-Property Plumes Monitored Attenuation
	Symbolic Rating	Symbolic Rating	Symbolic Rating	Symbolic Rating	Symbolic Rating	Symbolic Rating	Symbolic Rating
Overall Protection of Human Health and the Environment	○	●	●	⊙	⊙	●	●
How Alternative Provides Human Health & Environmental Protection	The Groundwater poses a risk to potential receptors, because of the affected private wells and the because of the presence of Rockton's public water supply. Contaminants of concern and exposure pathways discussed in the 2001 Baseline Risk Assessment (BLRA) remain unchanged Does not meet the groundwater quality objective outlined in Federal and State ARARs.	The current pump and treat system installed for the on-property groundwater plume is doing an effective job of controlling the affected groundwater. The point of entry treatment systems installed on the private wells are sufficient to provide protection to the residents. Three private wells have had concentrations of PCE, which do not meet specified ARARs. The off-property groundwater plumes will eventually discharge into the Rock River and will not likely affect the village of Rockton's water supply. The dilution effect of the Rock River will create a concentration that will likely not be of concern. Exposure control of the off-property groundwater plumes should sufficiently protect residents from exposure.	The current pump and treat system installed for the on-property groundwater plume is doing an effective job of controlling the affected groundwater. The points of use systems installed on the private wells are sufficient to provide protection to the residents along with the treatment of the plume. A pump and treat system for the off-property plume would reduce the plume size and concentration providing additional protection of the public water supply.	A chemical oxidation treatment of the groundwater VOC source area would eliminate the continued release from the source, however, shut-down of the existing pump & treat system allows the potential for VOCs to affect private wells without point of entry treatment systems. The point of entry treatment systems installed on the private wells are sufficient to provide protection to the residents along with local treatment of the plume The off-property groundwater plumes will eventually discharge into the Rock River and will not likely affect the village of Rockton's water supply. The dilution effect of the Rock River will create concentrations that will not likely be of concern Exposure control of the off-property groundwater plumes should sufficiently protect residents from exposure.	A chemical oxidation treatment of the groundwater VOC source area would eliminate the continued release from the source, however, shut-down of the existing pump & treat system allows the potential for VOCs to affect private wells without point of entry treatment systems. The point of entry treatment systems installed on the private wells are sufficient to provide protection to the residents along with local treatment of the plume. A pump and treat system for the off-property plumes would reduce the plume size and concentration, providing additional protection of the public water supply.	The current pump and treat system installed for the on-property groundwater plume is doing an effective job of controlling the affected groundwater. A chemical oxidation treatment of the groundwater VOC source area would eliminate the continued release from the source and reduce the potential for VOCs affecting private wells. The point of entry treatment systems installed on the private wells are sufficient to provide protection to the residents along with the treatment of the plume. A pump and treat system for the off-property plume would reduce the plumes size and concentration, providing additional protection of the public water supply. The off-property groundwater plumes will eventually attenuate and discharge into the Rock River and will not likely affect the village of Rockton's water supply. The dilution effect of the Rock River will create concentrations that will not likely be of concern. Exposure control of the off-property groundwater plumes should sufficiently protect residents from exposure.	The current pump and treat system installed for the on-property groundwater plume is doing an effective job of controlling the affected groundwater. Dual phase extraction and treatment of the groundwater VOC source area would eliminate the continued release from the source and reduce the potential for VOC's affecting private wells. The point of entry treatment systems installed on the private wells are sufficient to provide protection to the residents along with the treatment of the plume. The off-property groundwater plumes will eventually attenuate and discharge into the Rock River and will not likely affect the village of Rockton's water supply. The dilution effect of the Rock River will create concentrations that will not likely be of concern. Exposure control of the off-property groundwater plumes should sufficiently protect residents from exposure.
Compliance with ARARs	○	●	●	●	●	●	●
a Compliance With Chemical Specific Action-Specific, and Location Specific ARARs	Does not meet drinking water requirements due to affected private wells.See Table 2.19 for summary of compliance with ARARs.	Meets the requirements of the Federal and State ARARs. See Table 2.19 for summary of compliance with ARARs.	Meets the requirements of the Federal and State ARARs. See Table 2.19 for summary of compliance with ARARs.	Meets the requirements of the Federal and State ARAR See Table 2.19 for summary of compliance with ARARs..	Meets the requirements of the Federal and State ARARs. See Table 2.19 for summary of compliance with ARARs.	Meets the requirements of the Federal and State ARARs. See Table 2.19 for summary of compliance with ARARs.	Meets the requirements of theFederal and State ARARs. See Table 2.19 for summary of compliance with ARARs.
Long-Term Effectiveness and Permanence	○	⊙	⊙	●	●	●	●
a Magnitude of Residual Risk	Remaining risk will increase due to the removal of the current remedial systems and treatment. Risks in the BLRA calculated risk with the assumption that a remediation system would not be in place.	At the conclusion of these remedial activities, the groundwater concentrations will be reduced to below state IAC Part 620 standards for the on-property groundwater plume. However, the remedial timeframe is at least 30 years due to slow VOC removal from the source area. Affected groundwater from the off-property groundwater plumes not treated by this remedial activity will continue to attenuate and move towards the Rock River and eventually discharge and become	At the conclusion of these remedial activities, the on- and off property groundwater concentrations will be reduced to below state IAC Part 620 standards for the on-property groundwater plume. However, the remedial timeframe is at least 30 years due to slow VOC removal from the source area.	At the conclusion of these remedial activities, the groundwater concentrations will be reduced to below state IAC Part 620 standards for the on-property groundwater plume. Affected groundwater not treated with the source treatment will disperse and concentrations will become diluted. Affected groundwater from the off-property groundwater plumes not treated by this remedial activity will continue to attenuate and move	At the conclusion of these remedial activities, the groundwater concentrations will be reduced to below the state IAC Part 620 standards for the on-property groundwater plume and off-property groundwater plumes. Affected groundwater from the on-property groundwater plume not treated by this remedial activity will disperse and concentrations will become diluted.	At the conclusion of these remedial activities, the groundwater concentrations will be reduced to below the state IAC Part 620 standards for the on-property groundwater plume. Affected groundwater from the off-property groundwater plumes not treated by this remedial activity will continue to attenuate and move towards the Rock River and eventually discharge and become diluted to a point below IAC Part 620 standards.	At the conclusion of these remedial activities, the groundwater concentrations will be reduced to below the MCLs for the on-property groundwater plume and off-property groundwater plumes. Continuation of monitoring and reporting will be required to assess the effectiveness of treatment.	At the conclusion of these remedial activities, the groundwater concentrations will be reduced to below the state IAC Part 620 standards for the on-property groundwater plume. Affected groundwater from the off-property groundwater plumes not treated by this remedial activity will continue to attenuate and move towards the Rock River and eventually discharge and become diluted to a point below IAC Part 620 standards.

As Cont'd

TABLE 2.19
Detailed Analysis of Alternatives
Beloit Corporation, Rockton Facility
Rockton, Illinois

CRITERIA	ALTERNATIVE 1 No Action - includes discontinuation of the current remedial system	ALTERNATIVE 2	ALTERNATIVE 2A Groundwater Pump & Treat, Groundwater	ALTERNATIVE 3 Groundwater VOC Source Treatment and Off-Property Groundwater Plumes Monitored Attenuation	ALTERNATIVE 3A Groundwater VOC Source Treatment and Off-Property Groundwater Pump	ALTERNATIVE 4 On-Property Groundwater Pump & Treat, VOC Source Treatment (Dual Phase) and Off-Property Plumes Monitored Attenuation	ALTERNATIVE 4A On-Property Groundwater Pump & Treat, VOC Source Treatment (Dual Phase) and Off-Property Plumes Monitored Attenuation	ALTERNATIVE 4B On-Property Groundwater Pump & Treat, VOC Source Treatment (Dual Phase) and Off-Property Plumes Monitored Attenuation
	Symbolic Rating	Symbolic Rating	Symbolic Rating	Symbolic Rating	Symbolic Rating	Symbolic Rating	Symbolic Rating	Symbolic Rating
		diluted to a point below IAC Part 620 standards.		towards the Rock River and eventually discharge and become diluted to a point below IAC Part 620 standards.				
Assessment and Reliability of Controls	No action will not meet the Remedial Action Objectives.	Long-term monitoring of the on and off-property groundwater plumes will be required until the contaminant levels fall below state IAC Part 620 standards. The wells used for monitoring may have to be redeveloped, abandoned, or additional wells installed. The risks associated with these activities are considered low. Operation and maintenance activities will continue as they currently are and may require repair of wells or the extraction and air stripping system. Risks associated with this activity are considered low. The uncertainties associated with the disposal of the residuals from the activated carbon treatment of the private wells are considered low. Technology associated with this alternative has been well tested and is considered a reliable means of remediation.	Long-term monitoring of the on and off-property groundwater plumes will be required until the contaminant levels fall below state IAC Part 620 standards. The wells used for monitoring may have to be redeveloped, abandoned, or additional wells installed. The risks associated with these activities are considered low. Operation and maintenance activities will continue as they currently are and may require repair of wells or the extraction and air stripping system. Risks associated with this activity are considered low. The uncertainties associated with the disposal of the residuals from the activated carbon treatment of the private wells are considered low. Technology associated with this alternative has been well tested and is considered a reliable means of remediation. Construction of the additional pump and treat system will create risk for construction workers associated with the railroad and vehicle traffic.	Long-term monitoring of the on and off-property groundwater plumes will be required until the contaminant levels fall below state IAC Part 620 standards. The wells used for monitoring may have to be redeveloped, abandoned, or additional wells installed. The risks associated with these activities are considered low. Operation and maintenance activities may require repair of wells and the chemical injection system. Risks associated with this activity are considered low. The uncertainties associated with the disposal of the residuals from the activated carbon treatment of the private wells are considered low Technology associated with this alternative has been well tested and is considered a reliable means of remediation	Long-term monitoring of the on and off-property groundwater plumes will be required until the contaminant levels fall below state IAC Part 620 standards. The wells used for monitoring may have to be redeveloped, abandoned, or additional wells installed. The risks associated with these activities are considered low. Operation and maintenance activities may require repair of wells and the chemical injection system. Risks associated with this activity are considered low. The uncertainties associated with the disposal of the residuals from the activated carbon treatment of the private wells are considered low. Technology associated with this alternative has been well tested and is considered a reliable means of remediation.	Long-term monitoring of the on- and off-property groundwater plumes will be required until the contaminant levels fall below state IAC Part 620 standards. The wells used for monitoring may have to be redeveloped, abandoned, or additional wells installed. The risks associated with these activities are considered low. Operation and maintenance activities may require repair of wells and the chemical injection system. The uncertainties associated with the disposal of the residuals from the activated carbon treatment of the private wells are considered low. Technology associated with this alternative has been well tested and is considered a reliable means of remediation Construction of the additional pump and treat system will create risk for construction workers associated with the railroad and vehicle traffic.	Long-term monitoring of the on- and off-property groundwater plumes will be required until the contaminant levels fall below state IAC Part 620 standards. The wells used for monitoring may have to be redeveloped, abandoned, or additional wells installed. The risks associated with these activities are considered low. Operation and maintenance activities may require repair of wells and the chemical injection system. Operation and maintenance activities may require repair of wells and the extraction and air stripping systems. The uncertainties associated with the disposal of the residuals from the activated carbon treatment of private wells are considered low. Technology associated with this alternative has been well tested and is considered a reliable means of remediation.	Long-term monitoring of the on- and off-property groundwater plumes will be required until the contaminant levels fall below state IAC Part 620 standards. The wells used for monitoring may have to be redeveloped, abandoned, or additional wells installed. The risks associated with these activities are considered low. Operation and maintenance activities may require repair of wells and the dual phase extraction system. The uncertainties associated with the disposal of the residuals from the activated carbon treatment of the private wells are considered low. Technology associated with this alternative has been well tested and is considered a reliable means of remediation.
4. Reduction of Toxicity, Mobility, or Volume Through Treatment	○	◎	◎	◎	◎	●	●	●
a. Treatment Process and Remedy	No action will not address the principle concern of VOCs in the groundwater.	This alternative relies on treatment to achieve the remedial objectives. The extraction and air stripping of water from the on-property groundwater plume is reducing the levels of VOCs in the groundwater. Reduction of VOCs levels in the off-property plume will continue to decline by natural attenuation, indirectly as the result of treatment of the on-property plume that serves as a continuing source of VOCs to this groundwater.	This alternative relies on treatment to achieve the remedial objectives. The extraction and air stripping of water from the on-property groundwater plume is reducing the levels of VOCs in the groundwater. The extraction and air stripping of water from the off-property groundwater plumes will reduce the level of VOCs in the groundwater.	This alternative relies on treatment to achieve the remedial objectives. Chemical oxidation of water from the groundwater VOC source will reduce the levels of VOCs at the source. Reductions in the VOC concentrations in the off-property plume would be expected to continue following the removal of the source of VOCs, but at a reduced pace due to the shut down of the existing pump & treat system.	This alternative relies on treatment to achieve the remedial objectives. Chemical oxidation of water from the groundwater VOC source will reduce the levels of VOCs at the source The extraction and air stripping of water from the off-property groundwater plumes will reduce the level of VOCs in the groundwater.	This alternative relies on treatment to achieve the remedial objectives. Chemical oxidation of water from the groundwater VOC source will reduce the levels of VOCs at the source. The extraction and air stripping of water from the on-property groundwater plume is reducing the levels of VOCs in the groundwater. Reduction of VOCs levels in the off-property plume will continue by natural attenuation, indirectly as the result of treatment of the on-property plume that is a continuing source of VOCs to this groundwater.	This alternative relies on treatment to achieve the remedial objectives. Chemical oxidation of water from the groundwater VOC source will reduce the levels of VOCs at the source. The extraction and air stripping of water from the on-property groundwater plume is reducing the levels of VOCs in the groundwater. The extraction and air stripping of water from the off-property groundwater plumes will reduce the level of VOCs in the groundwater.	This alternative relies on treatment to achieve the remedial objectives. Dual phase extraction and treatment of water and vapor will reduce the levels of VOC's at the source. The extraction and air stripping of water from the on-property groundwater plume is reducing the levels of VOCs in the groundwater. Reduction of VOCs levels in the off-property plume will continue by natural attenuation, indirectly as the result of treatment of the on-property plume that serves as a continuing source of VOC's to this groundwater

TABLE 2.19
Detailed Analysis of Alternatives
Beloit Corporation, Rockton Facility
Rockton, Illinois

CRITERIA	ALTERNATIVE 1 No Action - Includes Continuation of the current Chemical Oxidation System	ALTERNATIVE 2 Groundwater VOC Treatment and Off-Property Groundwater Pump & Treat	ALTERNATIVE 3 Chemical Oxidation	ALTERNATIVE 4A Groundwater VOC Treatment and Off-Property Groundwater Pump & Treat	ALTERNATIVE 4 On-Property Groundwater Pump & Treat, VOC Source Treatment (Dual Phase) and Off-Property Plumes Monitored Attenuation	ALTERNATIVE 4 On-Property Groundwater Pump & Treat, VOC Source Treatment (Dual Phase) and Off-Property Plumes Monitored Attenuation	ALTERNATIVE 4B On-Property Groundwater Pump & Treat, VOC Source Treatment (Dual Phase) and Off-Property Plumes Monitored Attenuation
	Symbolic Rating	Symbolic Rating	Symbolic Rating	Symbolic Rating	Symbolic Rating	Symbolic Rating	Symbolic Rating
b Amount of Hazardous Material Destroyed or Treated	No action will not destroy or treat any amount of hazardous material.	The extraction and air stripping of groundwater from the on-property plume has removed approximately 280 pounds of VOCs from the summer of 1996 to the winter of 2001. No removal of VOCs in the off-property plume will occur through treatment. The groundwater VOC source levels will not be significantly reduced through this option.	The extraction and air stripping of groundwater from the on-property plume has removed approximately 280 pounds of VOCs from the summer of 1996 to the winter of 2001. Similar removal of VOCs could be expected of the extraction and air stripping unit for the off-site groundwater plume. The groundwater VOC source levels will not be significantly reduced through this option.	Chemical oxidation of the groundwater source area will remove the source of the VOCs for the on-property groundwater plume. Groundwater that has already migrated outside of the source area will not be treated. No removal of VOCs in the off-property plume will occur through treatment.	Chemical oxidation of the groundwater source area will remove the source of the VOCs for the on-property groundwater plume. Groundwater that has already migrated outside of the source area will be captured and treated via the Off-Property Pump and Treat system. Removal of VOCs would be similar to the current extraction and air stripping system for the on-property groundwater plume.	Chemical oxidation of the groundwater source area will remove the source of the VOCs for the on-property groundwater plume. No removal of VOCs in the off-property plume will occur through treatment. The extraction and air stripping of groundwater from the on-property plume has removed approximately 280 pounds of VOCs from the summer of 1996 to the winter of 2001. Removal of VOCs would be similar to the current extraction and air stripping system for the on-property groundwater plume.	Chemical oxidation of the groundwater source area will remove the source of the VOCs for the on-property groundwater plume. The extraction and air stripping of groundwater from the on-property plume has removed approximately 280 pounds of VOCs from the summer of 1996 to the winter of 2001. Removal of VOCs would be similar to the current extraction and air stripping system for the on-property groundwater plume.	Dual phase extraction of the groundwater source area will remove the source of the VOCs for the on-property groundwater plume. No removal of VOCs in the off-property plume will occur through treatment. The extraction and air stripping of groundwater from the on-property plume has removed approximately 280 pounds of VOCs from the summer of 1996 to the winter of 2001.
c Reduction in Toxicity Mobility or Volume through Treatment	No action will not reduce the toxicity, mobility or volume except through dilution.	The extraction and air stripping of the on-property groundwater plume has restricted the mobility of the plume, but it has not significantly reduced the volume or the concentration of the source. Reduction of toxicity, mobility, and volume through treatment will not occur for the off-property groundwater plume. However, cutting-off of the VOC source with the existing on-property pump & treat system will allow the slow remediation of the off-property groundwater plumes through natural attenuation.	The extraction and air stripping of the on-property groundwater plume and off-property groundwater plumes should restrict the mobility of these plumes. Reduction of toxicity, mobility, or volume will be similar for the extraction and air stripping of the on-property groundwater plume as compared to the off-property groundwater plumes. The combination of these two treatment systems will slowly reduce the mobility and volume of VOCs in the groundwater.	The treatment of the groundwater VOC source should reduce the toxicity and mass of the source. The treatment of the groundwater VOC source area alone will not significantly reduce the mobility or volume of the rest of the on-property plume. Reduction through treatment will not occur for the off-property groundwater plumes. However, removal of the VOC source will allow the slow remediation of the off-property groundwater plumes through natural attenuation.	The treatment of the groundwater VOC source should reduce the toxicity and mass of the source. The treatment of the groundwater VOC source area alone will not significantly reduce the mobility or volume of the rest of the on-property plume. The extraction and air stripping of the off-property groundwater plumes should restrict the mobility and volume of the plume.	The treatment of the groundwater VOC source should reduce the toxicity and mass of the source. The extraction and air stripping of the on-property groundwater plume has restricted the mobility of the plume, but it has not significantly reduced the volume or the concentration of the source. Reduction through treatment will not occur for the off-property groundwater plumes. However, the existing pump & treat system and removal of the VOC source will allow the remediation of the off-property groundwater plumes through natural attenuation.	The treatment of the groundwater VOC source should reduce the toxicity and mass of the source. The extraction and air stripping of the on-property groundwater plume has restricted the mobility of the plume, but it has not significantly reduced the volume or the concentration of the source. The extraction and air stripping of the off-property groundwater plumes should restrict the mobility and volume of the plume.	The treatment of the groundwater VOC source should reduce the toxicity and mass of the source The extraction and air stripping of the on-property groundwater plume has restricted the mobility of the plume, but it has not significantly reduced the volume or the concentration of the source. Reduction through treatment will not occur for the off-property groundwater plumes. However, the existing pump & treat system and removal of the VOC source will allow the remediation of the off-property groundwater plumes through natural attenuation.
d Irreversibility of the Treatment	No action will be reversible.	The extraction and air stripping treatment process of the on-property groundwater plume will be an irreversible process. Attenuation monitoring and exposure control measures placed on the site will be a reversible process. The use of point of entry treatment for the private wells is a reversible process. Connection of these wells to the municipal water supply is not a reversible process. Redrilling of these wells to a deeper, clean aquifer is not a reversible process.	The extraction and air stripping treatment process of the on-property groundwater plume will be an irreversible process. The extraction and air stripping treatment process of the off-property groundwater plumes will be an irreversible process. The use of point of entry treatment for the private wells is a reversible process. Connection of these wells to the municipal water supply is not a reversible process. Redrilling of these wells to a deeper, clean aquifer is not a reversible process. The extraction and air stripping treatment process of the off-property groundwater plumes will be an irreversible process.	The chemical oxidation treatment process of the groundwater VOC source area will be an irreversible process. Attenuation monitoring and exposure control measures placed on the site will be a reversible process. The installation of the point of entry treatment for the private wells is a reversible process. Connection of these wells to the municipal water supply is not a reversible process. Redrilling of these wells to a deeper, clean aquifer is not a reversible process.	The chemical oxidation treatment process of the groundwater VOC source area will be an irreversible process. The extraction and air stripping treatment process of the off-property groundwater plumes will be an irreversible process. The use of point of entry treatment for the private wells is a reversible process. Connection of these wells to the municipal water supply is not a reversible process. Redrilling of these wells to a deeper, clean aquifer is not a reversible process. The extraction and air stripping treatment process of the off-property groundwater plumes will be an irreversible process.	The chemical oxidation treatment process of the groundwater VOC source area will be an irreversible process. The extraction and air stripping treatment process of the on-property groundwater plume will be an irreversible process. The use of point of entry treatment for the private wells is a reversible process. Connection of these wells to the municipal water supply is not a reversible process. Redrilling of these wells to a deeper, clean aquifer is not a reversible process. Attenuation monitoring and exposure control measures placed on the site will be a reversible process.	The chemical oxidation treatment process of the groundwater VOC source area will be an irreversible process. The extraction and air stripping treatment process of the on-property groundwater plume will be an irreversible process. The use of point of entry treatment for the private wells is a reversible process. Connection of these wells to the municipal water supply is not a reversible process. Redrilling of these wells to a deeper, clean aquifer is not a reversible process. The extraction and air stripping treatment process of the off-property groundwater plumes will be an irreversible process.	The dual phase extraction and treatment process of the groundwater VOC source area will be an irreversible process. The extraction and air stripping treatment process of the on-property groundwater plume will be an irreversible process. The use of point of entry treatment for the private wells is a reversible process. Connection of these wells to the municipal water supply is not a reversible process. Redrilling of these wells to a deeper, clean aquifer is not a reversible process. Attenuation monitoring and exposure control measures placed on the site will be a reversible process
e Type and Quantity of Treatment Residual 4e Con't	No action will not result in treatment residuals because no treatment of the VOCs will occur.	The existing extraction and air stripping treatment will result in VOC emissions. Attenuation monitoring or exposure control measures will not result in any treatment residuals Residuals from any well drilling or	The existing extraction and air stripping treatment will result in VOC emissions. Residuals from any well drilling or piping trenches will be managed according to the applicable regulations. It is anticipated that these materials will not be classified	The chemical oxidation will not result in any treatment residuals. Attenuation monitoring or exposure control measures will not result in any treatment residuals. Residuals from any well drilling or	The chemical oxidation will not result in any treatment residuals. The existing extraction and air stripping treatment will result in VOC emissions. Residuals from any well drilling or	The chemical oxidation will not result in any treatment residuals. The existing extraction and air stripping treatment will result in VOC emissions. Attenuation monitoring or exposure	The chemical oxidation will not result in any treatment residuals. The existing extraction and air stripping treatment will result in VOC emissions. Residuals from any well drilling or	The dual phase extraction system and existing pump & treat system will result in VOC emissions. Attenuation monitoring or exposure control measures will not result in any treatment residuals. Residuals from any well drilling or

TABLE 2.19
Detailed Analysis of Alternatives
Beloit Corporation, Rockton Facility
Rockton, Illinois

CRITERIA	ALTERNATIVE 1 No Action - includes the discontinuation of the current remedial system	ALTERNATIVE 2A On-Property Groundwater Pump & Treat, VOC Source Treatment and Off-Property Groundwater Plumes Monitored Attenuation	ALTERNATIVE 2B On-Property Groundwater Pump & Treat, VOC Source Treatment and Off-Property Groundwater Plumes Monitored Attenuation	ALTERNATIVE 3 Groundwater VOC Source Treatment and Off-Property Groundwater Plumes Monitored Attenuation	ALTERNATIVE 3A Groundwater VOC Source Treatment and On-Property Groundwater Pump & Treat	ALTERNATIVE 4 On-Property Groundwater Pump & Treat, VOC Source Treatment and Off-Property Groundwater Plumes Monitored Attenuation	ALTERNATIVE 4A On-Property Groundwater Pump & Treat, VOC Source Treatment (Dual Phase) and Off-Property Groundwater Plumes Monitored Attenuation	ALTERNATIVE 4B On-Property Groundwater Pump & Treat, VOC Source Treatment (Dual Phase) and Off-Property Plumes Monitored Attenuation
	Symbolic Rating	Symbolic Rating	Symbolic Rating	Symbolic Rating	Symbolic Rating	Symbolic Rating	Symbolic Rating	Symbolic Rating
		piping trenches will be managed according to the applicable regulations. It is anticipated that these materials will not be classified as hazardous wastes.	as hazardous wastes.	piping trenches will be managed according to the applicable regulations. It is anticipated that these materials will not be classified as hazardous wastes.	piping trenches will be managed according to the applicable regulations. It is anticipated that these materials will not be classified as hazardous wastes.	control measures will not result in any treatment residuals. Residuals from any well drilling or trenching will be managed according to the applicable regulations. It is anticipated that these materials will not be classified as hazardous wastes.	piping trenches will be managed according to the applicable regulations. It is anticipated that these materials will not be classified as hazardous wastes.	trenching will be managed according to the applicable regulations. It is anticipated that these materials will not be classified as hazardous wastes.
1. Standard Preference for Treatment as a Principal Element	The inherent hazards at the Beloit Corporation NPL Site will not be reduced, they will remain at their current condition.	The inherent hazards for the on-property groundwater plume are being reduced by treatment. The inherent hazards for the off-property groundwater plumes will not be reduced by direct treatment, however over time hazards will decline in response to natural attenuation processes.	The inherent hazards for the on-property groundwater plume are being reduced by treatment. The inherent hazards for the off-property groundwater plumes will be reduced by treatment.	The inherent hazards for the groundwater VOC source would be reduced by the treatment of the VOCs. The inherent hazards for the remaining on-property and off-property groundwater plumes will not be reduced by direct treatment, however over a long period of time hazards will decline in response to natural attenuation processes.	The inherent hazards for the groundwater VOC source would be reduced by the treatment of the VOCs. The inherent hazards for the off-property groundwater plumes will be reduced by treatment.	The inherent hazards for the on-property groundwater plume are being reduced by treatment. The inherent hazards for the groundwater VOC source would be reduced by the treatment of the VOCs. The inherent hazards for the off-property groundwater plumes will not be reduced by direct treatment, however over time hazards will decline in response to natural attenuation processes.	The inherent hazards for the on-property groundwater plume are being reduced by treatment. The inherent hazards for the groundwater VOC source would be reduced by the treatment of the VOCs The inherent hazards for the off-property groundwater plumes will be controlled by treatment but not reduced.	The inherent hazards for the on-property groundwater plume are being reduced by treatment. The inherent hazards for the groundwater VOC source would be reduced by the treatment of the VOCs. The inherent hazards for the off-property groundwater plumes will not be reduced by direct treatment, however over time hazards will decline in response to natural attenuation processes.
2. Short-Term Effectiveness	○	●	●	●	●	●	●	●
a. Protection of Community During Remedial Actions	Current risks will remain as described in the 2001 BLRA. The risk will increase from current conditions to those with affected private wells.	Risks will remain similar to current conditions. Currently the community is protected as affected wells have point-of-entry treatment.	Risks from the on-property groundwater plume will remain similar to current conditions. Currently the community is protected as affected wells have point-of-entry treatment. Risks to the Rockton water supply will be reduced.	Risks from the on-property groundwater plume will be reduced. Currently the community is protected as affected wells have point-of-entry treatment. Risks for the off-property groundwater plumes will remain the same.	Risks from the on-property groundwater plume will be reduced. Currently the community is protected as affected wells have point-of-entry treatment. Risks to the Rockton water supply will be reduced	Risks from the on-property groundwater plume will be reduced. Currently the community is protected as affected wells have point-of-entry treatment. Risks for the off-property groundwater plumes will remain the same.	Risks from the on-property groundwater plume will be reduced. Currently the community is protected as affected wells have point-of-entry treatment. Risks to the Rockton water supply will be reduced.	Risks from the on-property groundwater plume will be reduced. Currently the community is protected as affected wells have point-of-entry treatment Risks to the Rockton water supply will be reduced
b. Protection of Workers During Remedial Actions	Workers will be exposed to minimal risk with the removal of the current systems.	Workers will have minimal risk. Only needed for attenuation monitoring, and maintenance and operation of current pump & treat system. These risks can be managed through use of personnel protective equipment.	Workers may be exposed to hazardous constituents with the installation of an extraction and air stripping system for the off-property groundwater plumes. These risks can be managed through use of personnel protective equipment. Workers will have minimal risk. Only needed for monitoring, maintenance and operation of current extraction and air stripping system for on-property groundwater plume. Workers will have risk associated with the construction of the new pump and treat for the off-property groundwater plumes due to the proximity of the railroad and vehicle traffic.	Workers may be exposed to hazardous constituents with the installation of the chemical oxidation treatment system for the groundwater VOC source area. These risks can be managed through use of personnel protective equipment. However, risks to workers are greater than compared to alternatives that do not involve chemical oxidation. Workers will be exposed to minimal risk with the removal of the current systems. Workers will have minimal risk. Only needed for attenuation monitoring. These risks can be managed through use of personnel protective equipment	Workers may be exposed to hazardous constituents with the installation of the chemical oxidation treatment system for the groundwater VOC source area. These risks can be managed through use of personnel protective equipment. However, risks to workers are greater than compared to alternatives that do not involve chemical oxidation. Workers will be exposed to minimal risk with the removal of the current systems. Workers may be exposed to hazardous constituents with the installation of an extraction and air stripping system for the off-property groundwater plumes. These risks can be managed through use of personnel protective equipment. Workers will have risk associated with the construction of the new pump and treat for the off-property groundwater plumes due to the proximity of the railroad and vehicle	Workers will have minimal risk. Only needed for attenuation monitoring, and maintenance and operation of current pump & treat system. These risks can be managed through use of personnel protective equipment. Workers may be exposed to hazardous constituents with the installation of the chemical oxidation treatment system for the groundwater VOC source area. These risks can be managed through use of personnel protective equipment. However, risks to workers are greater than compared to alternatives that do not involve chemical oxidation. Workers will have risk associated with the construction of the new	Workers may be exposed to hazardous constituents with the installation of an extraction and air stripping system for the off-property groundwater plumes. These risks can be managed through use of personnel protective equipment. Workers will have minimal risk. Only needed for monitoring, maintenance and operation of current extraction and air stripping system for on-property groundwater plume. Workers may be exposed to hazardous constituents with the installation of the chemical oxidation treatment system for the groundwater VOC source area. These risks can be managed through use of personnel protective equipment. However, risks to workers are greater than compared to alternatives that do not involve chemical oxidation. Workers will have risk associated with the construction of the new	Workers will have minimal risk. Only needed for attenuation monitoring, and maintenance and operation of current pump & treat system. These risks can be managed through use of personnel protective equipment. Workers may be exposed to hazardous constituents with the installation of the dual phase extraction and treatment system for the groundwater VOC source area. These risks can be managed through use of personnel protective equipment. However, risks to workers are greater than compared to alternatives that do not involve source treatment.
3b Con't.								

TABLE 2.19
Detailed Analysis of Alternatives
Beloit Corporation, Rockton Facility
Rockton, Illinois

CRITERIA	ALTERNATIVE 1 No Action - Includes the discontinuation of the current remedial system	ALTERNATIVE 2A [illegible] Groundwater Pump & Treat for Groundwater [illegible]	ALTERNATIVE 3 Groundwater VOC Source Treatment and Off-Property Groundwater Plumes Monitored Attenuation	ALTERNATIVE 3A Groundwater VOC Source Treatment and Off-Property Groundwater Pump & Treat	ALTERNATIVE 4 [illegible] Groundwater Pump & Treat for VOC Source Treatment and Off-Property Groundwater Plumes Monitored Attenuation	ALTERNATIVE 4A On-Property Groundwater Pump & Treat for VOC Source Treatment (Oxidation) and Off-Property Groundwater Pump & Treat	ALTERNATIVE 4B On-Property Groundwater Pump & Treat, VOC Source Treatment (Dual Phase) and Off-Property Plumes Monitored Attenuation
	Symbolic Rating	Symbolic Rating	Symbolic Rating	Symbolic Rating	Symbolic Rating	Symbolic Rating	Symbolic Rating
				traffic		pump and treat for the off-property groundwater plumes due to the proximity of the railroad and vehicle traffic.	
[illegible] mental Impacts	Present potential ecological risks described in the BLRA will remain.	Environmental impacts will remain the same as current conditions. Risk to the Rock River is minimal due to the large dilution factor that will occur as the off-property groundwater plumes discharge into the river.	Environmental impacts will remain the same as current conditions for the on-property groundwater plume. Risk to the Rock River will be reduced with the installation of the extraction and air stripping system for the off-property groundwater plumes.	Environmental impacts of the on-property groundwater plume will be reduced with the treatment of the source area. Risk to the Rock River is minimal due to the large dilution factor that will occur as the off-property groundwater plumes discharge into the river.	Environmental impacts of the on-property groundwater plume will be reduced with the treatment of the source area. Risk to the Rock River will be reduced with the installation of the extraction and air stripping system for the off-property groundwater plumes.	Risk to the Rock River is minimal due to the large dilution factor that will occur as the off-property groundwater plumes discharge into the river. Environmental impacts of the on-property groundwater plume will be reduced with the treatment of the source area.	Risk to the Rock River will be reduced with the installation of the extraction and air stripping system for the off-property groundwater plumes. Environmental impacts of the on-property groundwater plume will be reduced with the treatment of the source area.	Risk to the Rock River is minimal due to the large dilution factor that will occur as the off-property groundwater plumes discharge into the river. Environmental impacts of the on-property groundwater plume will be reduced with the treatment of the source area.
Time Until Remedial Action Objectives Are Achieved	Remedial objectives will not be achieved.	The remedial objectives will be achieved in the long term as the source area is slowly remediated through the on-property extraction system. The anticipated remedial time frame for this alternative is 30 years. Monitoring will be required to determine when remedial objectives will be achieved.	The remedial objectives will be achieved in the long term as the source area is slowly remediated through the on-property extraction system. The anticipated remedial time frame for this alternative is 30 years. Monitoring will be required to determine when remedial objectives will be achieved.	The remedial objectives will be achieved for the on-property groundwater plume sooner than alternatives that do not include treatment of the source area. The anticipated remedial time frame for this alternative is 20 years. The remedial objectives will be achieved over the long-term as the plume disperses and discharges to the Rock River.	The remedial objectives will be achieved for the on-property groundwater plume sooner than alternatives that do not include treatment of the source area. The anticipated remedial time frame for this alternative is less than 20 years. The remedial objectives will be achieved for the off-property groundwater plumes in the long term as VOCs migrate from the on-property plume and are extracted and treated in the off-property extraction and treatment system. Monitoring will be required to determine when remedial objectives will be achieved.	The remedial objectives will be achieved for the on-property groundwater plume sooner than alternatives that do not include treatment of the source area. The anticipated remedial time frame for this alternative is 15 years. The remedial objectives will be achieved over the long-term as the plume disperses and discharges to the Rock River. The time frame will be shorter than for Alternatives 3 and 3a because the source is removed and on-property groundwater extraction will more quickly achieve remediation objectives on property.	The remedial objectives will be achieved for the on-property groundwater plume sooner than alternatives that do not include treatment of the source area. The anticipated remedial time frame for this alternative is 15 years. The remedial objectives will be achieved for the off-property groundwater plumes over a similar time frame as Alternative 4. Monitoring will be required to determine when remedial objectives will be achieved.	The remedial objectives will be achieved for the on-property groundwater plume sooner than alternatives that do not include treatment of the source area. The anticipated remedial time frame for this alternative is 15 years. The remedial objectives will be achieved over the long-term as the plume disperses and discharges to the Rock River. The time frame will be shorter than for Alternatives 3 and 3a because the source is removed and on-property groundwater extraction will more quickly achieve remediation objectives on property.
6 Implementability	•	•	•	•	•	•	•	•
a Technical Feasibility								
1 Ability to Construct and Operate the Technology	The removal of the current system will not cause any foreseen difficulties.	The ability to operate the technology for this alternative is already in place. The ability to implement exposure controls exists.	The ability to construct and operate the technology for this alternative is already in place. The construction of the off-property groundwater plumes pump and treat system would be difficult due to coordination with Railroad, water, street, sewer and other utilities and the presence of six road crossings.	The ability to construct and operate this chemical oxidation alternative would be moderately difficult due to the location of a portion of the groundwater VOC source being under an existing building footprint. The discontinuation of the current extraction and air stripping system is not anticipated to be difficult. The ability to monitor attenuation and if necessary, implement exposure controls, exists.	The ability to construct and operate this chemical oxidation alternative would be moderately difficult due to the location of a portion of the groundwater VOC source being under an existing building footprint. The ability to construct and operate the technology for this alternative is already in place. The discontinuation of the current extraction and air stripping system is not anticipated to be difficult. The construction of the off-property groundwater plumes pump and treat system would be difficult due to coordination with Railroad, water, street, sewer and other utilities and the presence of six road crossings.	The ability to construct and operate this chemical oxidation alternative would be moderately difficult due to the location of a portion of the groundwater VOC source being under an existing building footprint. The ability to construct and operate the technology for this alternative is already in place. The ability to monitor attenuation and if necessary, implement exposure controls, exists.	The ability to construct and operate this chemical oxidation alternative would be moderately difficult due to the location of a portion of the groundwater VOC source being under an existing building footprint. The ability to construct and operate the technology for this alternative is already in place. The construction of the off-property groundwater plumes pump and treat system would be difficult due to coordination with Railroad, water, street, sewer and other utilities and the presence of six road crossings.	The ability to construct and operate this dual phase extraction alternative would be moderately difficult due to the location of a portion of the groundwater VOC source being under an existing building footprint. The ability to construct and operate the technology for this alternative is already in place. The ability to monitor attenuation and if necessary, implement exposure controls, exists.

TABLE 2.19
Detailed Analysis of Alternatives
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CRITERIA	ALTERNATIVE 1 No Action – includes [illegible] discontinuation of [illegible] remedial system	[illegible] ALTERNATIVE 2A [illegible] Pump & [illegible] Groundwater [illegible]	ALTERNATIVE [illegible]	ALTERNATIVE 3A Groundwater VOC [illegible] Treatment and Off-[illegible] Groundwater Pump & [illegible]	ALTERNATIVE 4 [illegible] Groundwater Pump & [illegible] VOC Source Treatment (Oxidation) and Off-Property Plumes Monitored Attenuation	ALTERNATIVE [illegible] On-Property [illegible] Pump & Treat, VOC [illegible] (Oxidation) [illegible]	ALTERNATIVE 4B On-Property Groundwater Pump & Treat, VOC Source Treatment (Dual Phase) and Off-Property Plumes Monitored Attenuation
	Symbolic Rating	Symbolic Rating	Symbolic Rating	Symbolic Rating	Symbolic Rating	Symbolic Rating	Symbolic Rating
ii. Reliability of the Technology	Not applicable	Technology has been proven to be reliable	Technology has been proven to be reliable	Technology has been proven to be reliable	Technology has been proven to be reliable	Technology has been proven to be reliable	Technology has been proven to be reliable
iii. Ease of Undertaking Additional Remedial Actions, If Necessary	Easy to implement additional remedial actions, if necessary, because no action will initially occur.	Easy to implement additional remedial actions if determined necessary.	Easy to implement additional remedial actions if determined necessary.	Easy to implement additional remedial actions if determined necessary	Easy [illegible] implement additional remedial actions if determined necessary.	No additional remedial actions are anticipated.	No additional remedial actions are anticipated.	No additional remedial actions are anticipated.
iv. Ability to Monitor Effectiveness of Remedy	Easy to monitor the effectiveness of the remedy, because no action will occur	The effectiveness of this alternative can be evaluated through monitoring of the VOCs levels in the groundwater until remedial objectives are met for the on-property groundwater plume. Long term monitoring of the groundwater will be needed for the off-property groundwater plumes to monitor VOCs levels..	The effectiveness of this alternative can be evaluated through monitoring of the VOCs levels in the groundwater until remedial objectives are met for the on-property groundwater plume. Long term monitoring of the groundwater will be needed for the off-property groundwater plumes to monitor VOCs levels.	The effectiveness of this alternative can be evaluated through monitoring of the VOCs levels in then groundwater until remedial objectives are met for the on-property groundwater plume. Long term monitoring of the groundwater will be needed for the off-property groundwater plumes to monitor VOCs levels.	The effectiveness of this alternative can be evaluated through monitoring of the VOC's levels in the groundwater until remedial objectives are met for the on-property groundwater plume. Long term monitoring of the groundwater will be needed for the off-property groundwater plumes to monitor VOCs levels.	The effectiveness of this alternative can be evaluated through monitoring of the VOCs levels in the groundwater until remedial objectives are met for the on-property groundwater plume. Long term monitoring of the groundwater will be needed for the off-property groundwater plumes to monitor VOCs levels.	The effectiveness of this alternative can be evaluated through monitoring of the VOCs levels in the groundwater until remedial objectives are met for the on-property groundwater plume. Long term monitoring of the groundwater will be needed for the off-property groundwater plumes to monitor VOCs levels.	The effectiveness of this alternative can be evaluated through monitoring of the VOC's levels in the groundwater until remedial objectives are met for the on-property groundwater plume. Long term monitoring of the groundwater will be needed for the off-property groundwater plumes to monitor VOC's levels.
b. Administrative Feasibility							
i. Coordination With Other Agencies	Approvals to discontinue current remediation activities will be required	No additional approvals would be necessary for the on-property groundwater plume since this alternative is already in place, since this alternative is already in place. However, the existing NPDES permit will need to be revised or a new permit would need to be issued. Coordination the local municipalities would be needed to implement exposure controls.	Construction permits, additional NPDES permits, and approval from the IEPA would be necessary to implement the extraction and air stripping system for the off-property groundwater plumes. Coordination with the railroad for right of way access and with the local utilities for road crossings and underground utilities.	Approval from the IEPA would be necessary to implement the chemical oxidation system Coordination the local municipalities would be needed to implement exposure controls.	Approval from the IEPA would be necessary to implement the chemical oxidation system Construction permits, additional NPDES permits, and approval from the IEPA would be necessary to implement the extraction and air stripping system for the off-property groundwater plumes. Coordination with the railroad for right of way access and with the local utilities for road crossings and underground utilities.	Approval from the IEPA would be necessary to implement the chemical oxidation system Coordination the local municipalities would be needed to implement exposure controls. No additional approvals would be required for the extraction and air stripping system treating the on-property groundwater plume, since this alternative is already in place. However, the existing NPDES permit will need to be revised or a new permit would need to be issued.	Approval from the IEPA would be necessary to implement the chemical oxidation system Construction permits, additional NPDES permits, and approval from the IEPA would be necessary to implement the extraction and air stripping system for the off-property groundwater plumes. No additional approvals would be required for the extraction and air stripping system treating the on-property groundwater plume, since this alternative is already in place. However, the existing NPDES permit will need to be revised or a new permit would need to be issued. Coordination with the railroad for right of way access and with the local utilities for road crossings and underground utilities.	Approval from the IEPA would be necessary to implement the Dual Phase extraction system Coordination the local municipalities would be needed to implement exposure controls No additional approvals would be required for the extraction and air stripping system treating the on property groundwater plume, since this alternative is already in place However, the existing NPDES permit will need to be revised or a new permit would need to be issued
c. Availability of Services and Materials							
i. Availability of Off-Site Treatment, Storage, and Disposal Services and Capacity	There is sufficient availability for disposal of the current remedial activities. No off site treatment would be necessary.	No off-site treatment or storage will be needed for the on-property plume. Disposal of used carbon from the activated carbon treatment of private wells depends on the classification of the waste. However, these services are readily available.	No off-site treatment or storage will be needed for the on-property plume. Disposal of used carbon from the activated carbon treatment of private wells depends on the classification of the waste. However, these services are readily available.	No off-site treatment or storage will be needed for the on-property plume. Disposal of used carbon from the activated carbon treatment of private wells depends on the classification of the waste. However, these services are readily available.	No off-site treatment or storage will be needed for the on-property plume Disposal of used carbon from the activated carbon treatment of private wells depends on the classification of the waste. However, these services are readily available.	No off-site treatment or storage will be needed for the on-property plume. Disposal of used carbon from the activated carbon treatment of private wells depends on the classification of the waste. However, these services are readily available.	No off-site treatment or storage will be needed for the on-property plume. Disposal of used carbon from the activated carbon treatment of private wells depends on the classification of the waste. However, these services are readily available.	No off-site treatment or storage will be needed for the on-property plume. Disposal of used carbon from the activated carbon treatment of private wells depends on the classification of the waste. However, these services are readily available.

TABLE 2.19
Detailed Analysis of Alternatives
Beloit Corporation, Rockton Facility
Rockton, Illinois

CRITERIA	ALTERNATIVE 1	ALTERNATIVE 2	ALTERNATIVE 3	ALTERNATIVE 4A Groundwater Treatment and Off-Property Groundwater	ALTERNATIVE 4B (Dual Phase) and Off-Property Plumes Monitored Attenuation	ALTERNATIVE 4A Oxidation	ALTERNATIVE 4B On-Property Groundwater Pump & Treat, VOC Source Treatment (Dual Phase) and Off-Property Plumes Monitored Attenuation
	Symbolic Rating	Symbolic Rating	Symbolic Rating	Symbolic Rating	Symbolic Rating	Symbolic Rating	Symbolic Rating
a. Availability of Necessary Equipment and Specialists	Equipment and specialists for the removal of current remedial systems are readily available.	No additional equipment or specialists are needed for this alternative.	Equipment and specialists for the installation of an additional extraction and air stripping remedial system are readily available	Special equipment and specialists for the chemical oxidation of the groundwater VOC source area will be needed. However, these services are available. Equipment and specialists for the off-property exposure control are readily available.	Special equipment and specialists for the chemical oxidation of the groundwater VOC source area will be needed. However, these services are available Equipment and specialists for the installation of an additional extraction and air stripping remedial system are readily available.	Special equipment and specialists for the chemical oxidation of the groundwater VOC source area will be needed. However, these services are available No additional equipment or specialists are needed for the on-property groundwater plume treatment. Equipment and specialists for the off-property exposure control are readily available.	Special equipment and specialists for the chemical oxidation of the groundwater VOC source area will be needed. However, these services are available. Equipment and specialists for the installation of an additional extraction and air stripping remedial system are readily available. No additional equipment or specialists are needed for the on-property groundwater plume treatment. Equipment and specialists for the off-property exposure control are readily available.	Special equipment and specialists for the dual phase extraction and treatment of the groundwater VOC source area will be needed. However, these services are available. No additional equipment or specialists are needed for the on-property groundwater plume treatment. Equipment and specialists for the off-property exposure control are readily available.
b. Availability of Prospective Technologies	Not applicable	No additional technology needed for this alternative.	Air stripping installation and operation is a readily available technology.	Chemical oxidation is an available technology.	Chemical oxidation is an available technology. Air stripping installation and operation is a readily available technology.	Chemical oxidation is an available technology. No additional technology needed for the on-property groundwater plume treatment.	Chemical oxidation is an available technology. Air stripping installation and operation is a readily available technology.	Dual Phase extraction is an available technology. No additional technology needed for the on-property groundwater plume treatment.
7. Cost[b]								
a. Capital Costs[b]	Estimated capital cost is $ 0. These costs do not include the discontinuation of the current remedial systems.	Estimated capital cost is $462,000[c].	Estimated capital cost is $1,636,000[c].	Estimated capital cost is $740, 000.	Estimated capital cost is $1,899,000.	Estimated capital cost is $1,123,000.	Estimated capital cost is $2,263,000.	Estimated capital cost is $764,000
b. Annual Operation and Maintenance Costs	Estimated operation and maintenance cost is $ 0.	Estimated operation and maintenance cost is approximately $91,000 per year for 30 years.	Estimated operation and maintenance cost is approximately $175,000 per year for 30 years.	Estimated operation and maintenance cost is approximately $46,000 per year for 20 years.	Estimated operation and maintenance cost is approximately $129,000 per year for 20 years. This time frame is assumed for conservative cost estimating purposes. Actual time frames will likely be less than Alternative 3 due to the use of a village treatment system	Estimated operation and maintenance cost is approximately $92,000 per year for 15 years.	Estimated operation and maintenance cost is approximately $175,000 per year for 15 years.	Estimated operation and maintenance cost is approximately $146,000 per year for 15 years.
c. Net Present Worth Costs	Estimated 30-year net present worth (5% discount rate) is $ 0.	Estimated 30-year net present worth (7% discount rate) is $1,677,000.	Estimated 30-year net present worth (7% discount rate) is $3,890,000.	Estimated 20-year net present worth (7% discount rate) is $1,289,000.	Estimated 20-year net present worth (7% discount rate) is $3,327,000.	Estimated 15-year net present worth (7% discount rate) is $2,024,000.	Estimated 15-year net present worth (7% discount rate) is $3,919,000.	Estimated 15-year net present worth (7% discount rate) is $2,109,000
8. Support Agency (EPA) Acceptance								
	Not acceptable.	Not acceptable.	Not acceptable.	Not acceptable.	Not acceptable.	Acceptable.	Acceptable.	Acceptable.
9. Community Acceptance	Will be addressed after receiving comments on the Proposed Plan.	Will be addressed after receiving comments on the Proposed Plan.	Will be addressed after receiving comments on the Proposed Plan.	Will be addressed after receiving comments on the Proposed Plan.	Will be addressed after receiving comments on the Proposed Plan.	Will be addressed after receiving comments on the Proposed Plan.	Will be addressed after receiving comments on the Proposed Plan.	Will be addressed after receiving comments on the Proposed Plan.

Symbol Definition:

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- Alternative does not meet the requirements of this criteria.
- Alternative partially meets the requirements of this criteria.
- Alternative meets the requirements of this criteria.

...rounded to the nearest thousand dollars.

...that one or more of the private wells in either Blackhawk Acres or in the Village becomes affected by one of the VOC plumes, a contingency capital cost of $20,000 shall be ... municipal water supply, redrilling of the well to deeper depths, or the installation of point-of-entry treatment systems) for each affected residence will be made on an individual basis ... considered. These costs are not included in the net present worth costs for each alternative due to their uncertainty. Similar actions will also be taken if operation of the existing pump ... by the extension of extraction and air stripping system into Blackhawk Acres Subdivision.

...for each well that needs to be connected to the municipal water supply. However, a decision on the particular course of action (connection to ... a total of 77 potable water wells in the Village and in Blackhawk Acres. A contingency of $1,530,000 for each active alternative should be ... treatment systems in use in the Blackhawk Acres subdivision is required beyond the operational lifetime of these systems.

Table 2.20

Summary of Applicable or Relevant and Appropriate Requirements
Beloit Corporation Superfund Site
Blackhawk Facility, Rockton, Illinois

	ARARs	Description of Regulation	Applicability, Relevance, and Appropriateness	Potential ARARs for Each Alternative							
				Alt 1	Alt 2	Alt 2a	Alt 3	Alt 3a	Alt 4	Alt 4a	Alt 4b
	Chemical Specific										
	Federal										
1	40 CFR 50.6 National Primary and Secondary Ambient Air Quality Standards for Particulate Matter	Defined as: (1) 150 micrograms per cubic meter, 24-hour concentration (2) 50 micrograms per cubic meter, annual arithmetic mean, (3) particulate matter shall be measured as PM 20 (particulates with a diameter less than or equal to 10 micrometers).	Applies to alternatives that include excavation and drilling.			X	X	X		X	X
	40 CFR 53 Ambient Air Monitoring Reference and Equivalent Methods	Provides methods for monitoring conventional air pollutants in ambient air	Applies to alternatives that include excavation and drilling.			X	X	X		X	X
1	40 CFR 63 National Emission Standards for Hazardous Air Pollutants For Affected Source Categories	Contains national emission standards for hazardous air pollutants (NESHAP) established pursuant to section 112 of the Clean Air Act. Section includes TCE and PCE.	Applies to alternatives that include air treatment (air stripping) where NESHAP chemicals could be released		X	X		X	X	X	X
4	40 CFR 141 Federal Drinking Water Standards	Establishes MCLs and/or MCLGs for such things as inorganic and organic chemicals, turbidity, and microbial and radioactive contaminants	Relevant and appropriate due to [illegible] and public wells in the area. During implementation of remedial action the more stringent of either the MCLs or state regulations will be used.	X	X	X	X	X	X	X	X
5	40 CFR 143 Secondary Drinking Water Regulations	Establishes secondary MCLs.	Relevant and appropriate due to [illegible] and public wells in the area	X	X	X	X	X	X	X	X
6	40 CFR Part 61 National Emissions Standards for Hazardous Air Pollutants	Lists Perchloroethylene (50FR 52800; Dec. 26, 1985) and Trichloroethylene (50FR 52422; Dec. 23, 1985) as other substances that are considered to being the cause of serious health effects.	Relevant and appropriate to alternatives that includes air emissions of VOCs		X	X		X	X	X	X
	State										
1	IAC 35 Part 215 Organic Material Emissions Standards and Limitations	Contains standards and limitations for emissions of organic matter from stationary sources located outside of the Chicago area. Includes clean up and disposal operations.	Applies to treatment of the VOC [illegible] groundwater where organic matter could be emitted (i.e. air stripping)		X	X		X	X	X	X
2	IAC 35 Part 620 Groundwater Quality	Prescribes various aspects of groundwater quality, including method of classification of groundwaters, nondegradation provisions, standards for quality of groundwaters, and various procedures and protocols for the management and protection of groundwaters	Relevant and appropriate due to [illegible] and public wells in the area. During implementation of remedial action the more stringent of either the MCLs or state regulations will be used.	X	X	X	X	X	X	X	X
3	IAC 35 Part 302 Water Quality Standards -Subpart B General Use Water Quality Standards	Contains general use water quality standards which must be met in waters of the state for which there is no specific designation.	Relevant and appropriate for the Rock River. Applies to alternatives which include discharges of treated water into the Rock River.		X	X		X	X	X	X

Table 2.20

Summary of Applicable or Relevant and Appropriate Requirements
Beloit Corporation Superfund Site
Blackhawk Facility, Rockton, Illinois

ARARs	Description of Regulation	Applicability, Relevance and Appropriateness	Potential ARARs for Each Alternative							
			Alt 1	Alt 2	Alt 2a	Alt 3	Alt 3a	Alt 4	Alt 4a	Alt 4b
Location-Specific										
Federal										
Environmental Protection Act, Title IV, Section 14.1	Restricts the location of a public water supply. It can not be located within 400 feet of primary or secondary source of contamination in unconsolidated and unconfined sand and gravel formations.	To be Considered for all alternatives, contaminated layer consists of silty sand. However, closest public water supply is presently located over 1000 feet from the VOC plume	X	X	X	X	X	X	X	X
State										
77 IAC 920 Sh Illinois Water Well Construction Code - Location and 415 ILCS/5 - Title IV Public Water Supplies	Establishes that the installation of potable groundwater wells can not be within 200 feet of primary or secondary source of contamination for clay and loam soils, and not within 400 feet for more permeable formations	Relevant and appropriate for alternatives, contaminated layer consists of silty sand. However, not applicable since closest public water supply is presently over 1000 feet from the groundwater plume. Additionally, Beloit Corp water supply well is located approximately upgradient of the VOC source area	X	X	X	X	X	X	X	X

Table 2.20

Summary of Applicable or Relevant and Appropriate Requirements
Beloit Corporation Superfund Site
Blackhawk Facility, Rockton, Illinois

	ARARs	Description of Regulation	Applicability, Relevance and Appropriateness	Potential ARARs for Each Alternative							
				Alt 1	Alt 2	Alt 2a	Alt 3	Alt 3a	Alt 4	Alt 4a	Alt 4b
	Action-Specific										
	Federal										
1	40 CFR 122 EPA Administered Permit Programs - The National Pollutant Discharge Elimination System	Provides requirements for discharges into surface water associated with industrial facilities and construction projects.	Applies to alternatives which discharge treated water into the Rock River		X	X		X	X	X	X
2	40 CFR 122.41 EPA Administered Permit Programs, The National Pollutant Discharge Elimination System	Provides requirements for: (1) monitoring treatment system effluent, (2) compliance with additional substantive conditions; (3) compliance with Federally-approval State water quality standards, and (4) use of Best Available Technology (BAT).	Applies to alternatives which discharge treated water into the Rock River		X	X		X	X	X	X
	40 CFR Subpart K Criteria and Standards for the NPDES	Requires that a Best Management Practices program be designed and implemented to prevent the release of toxic or hazardous pollutants to waters of the U.S.	Applies to alternatives which discharge treated water into the Rock River		X	X	X	X	X	X	X
4	40 CFR 129 Toxic Pollutant Effluent Standards	Establishes effluent standards/prohibitions for toxic pollutants which may be incorporated into any NPDES permit.	Does not apply, TCE and PCE along with other contaminants found on site are not listed as toxic pollutants under this regulation.		NA	NA	NA	NA	NA	NA	NA
5	40 CFR 136 Test Procedures for the Analysis of Pollutants	Provides detailed requirements for analytical procedures and quality controls	Applicable to tests done under all circumstances		X	X	X	X	X	X	X
6	Clean Air Act Section 112 List of Source Categories and Hazardous Pollutants to be Regulated	Lists source categories and 189 substances to be regulated by EPA as air toxics under Section 112.	Relevant to alternatives which include an air stripping treatment device which will create emissions considered as air toxics.		X	X		X	X	X	X
9	40 CFR 268 Land Disposal Restrictions	Identifies hazardous wastes that are restricted from land disposal and defines those limited circumstances under which an otherwise prohibited waste may continue to be land disposed.	Applicable to alternatives that produce hazardous waste that will be disposed offsite. Examples may potentially include waste generated during drilling or construction.		X	X	X	X	X	X	X
11	40 CFR 58 Ambient Air Quality Surveillance	Establishes criteria and requirements for ambient air quality monitoring and requirements for reporting ambient air quality data and information	Applies to owners and operators of proposed sources		X	X		X	X	X	X
12	40 CFR Part 60 Standards of Performance for New Stationary Sources	Establishes standards for emissions performance of stationary sources	Applies to owners and operators of the alternative which includes any new stationary source which constitutes an affected facility.					X		X	
13	American Council of Governmental Industrial Hygienists (ACGIH) Threshold Limit Values (TLVs)	Establishes safety standards for use in the construction industry	Applicable to those alternatives that involve construction		X	X	X	X	X	X	X
14.	29 CFR Part 1910 Occupational Safety and Health Act (OSHA) - General Industry Standards	Establishes general industry standards.	Applicable at the site for those alternatives involving construction.		X	X	X	X	X	X	X
15.	29 CFR Part 1926 OSHA Safety and Health Standards for Construction	Establishes health and safety standards to be used in construction.	Applicable at the site for those alternatives involving construction.		X	X	X	X	X	X	X

Table 2.20

Summary of Applicable or Relevant and Appropriate Requirements
Beloit Corporation Superfund Site
Blackhawk Facility, Rockton, Illinois

	ARARs	Description of Regulation	Applicability, Relevance and Appropriateness	Potential ARARs for Each Alternative							
				Alt 1	Alt 2	Alt 3a	Alt 3	Alt 3a	Alt 4	Alt 4a	Alt 4b
	Action-Specific										
	State										
5	IAC 35 Air Pollution Part 201 142 Permits and General Provisions - Construction Permit Required	Requires a construction permit to be obtained from the Agency before any new emission source or air pollution control equipment, or modification of any existing emission source occur.	Substantive requirements applicable to alternatives that include the construction of a new air stripper and vapor phase carbon system. However, as a CERCLA remedy, no permit will be required.			X		X		X	
6	IAC 35 Part 309 Subpart A NPDES Permits	Provides instructions for NPDES permits for discharges into navigable waters of the state. Effluent limitations and monitoring requirements are established during the permitting process.	Applicable for alternatives that include discharging into navigable surface water		X	X		X	X	X	X
7	IAC 34 Part 304 Subpart A General Effluent Standards	Provides general limits for discharging to a surface water.	Applicable for alternatives that include discharging into navigable surface water		X	X		X	X	X	X
8	IAC 35 part 305 103 Effluent Measurement	Requires every effluent discharge sewers, pipes or outfalls to be designed so a sample of the effluent can be obtained at a point after the final treatment process and before discharge to or mixing with any waters of the state	Applies to alternatives which include discharging treated groundwater into the Rock River		X	X		X	X	X	X
9	IAC 35 Part 305 102 Reporting Requirements	Requires every pretreatment works, treatment works or wastewater source to submit operating reports to the IEPA at a frequency determined by the IEPA	Applies to alternatives which include treatment of the affected groundwater		X	X		X	X	X	X
10	IAC 29 Part 620 Emergency Planning and Community Right to Know	Establishes reporting procedures to ensure that the location and amount of hazardous chemicals in a facility is monitored and made available to the State Emergency Response Commission (SERC), the local planning committee, the local fire department and the public.	Not applicable because site will not have requirements for the levels of hazardous waste, extremely hazardous waste, Tier II, or Form R		X	X	X	X	X	X	X
12	77 Ill Adm Code 920 - Illinois Water Well Construction Code	Provides minimum standards for location, construction and modification of water wells, monitoring wells, and closed loop wells which are not otherwise subject to regulation under EPA, Title IV, Public Water Supplies (Ill Rev Stat, 1991, ch. 111 1-2, pars. 1014-1019)	Applies to the construction, modification or abandonment of monitoring/extraction wells. Applicable to alternatives that include the construction of MW extraction wells			X		X		X	
13	415 ILCS/5 - Environmental Protection Act Title XVII Site Remediation Program	Establishes a risk-based system of remediation based on the protection of human health and the environment relative to present and future uses of the site	Applies to all alternatives	X	X	X	X	X	X	X	X
14	Illinois EPA Administrative Procedure #11 Monitor Well Design Criteria	Establishes criteria of monitoring well design to ensure consistency and integrity of groundwater samples.	Applicable to alternatives that include construction, modification or installation of monitoring wells to be used	X	X	X	X	X	X	X	X

Legend
(TBC) = To-Be-Considered category of potential requirement that may apply to an alternative

TABLE 2.21
Summary of Cost Estimates
Beloit Corporation, Rockton Facility NPL Site
Rockton, Illinois

	Alternative	Cost		
		Capital	Annual O&M	Net Present Worth
1	No Action [1]	$0	$0	$0
2	On-Property Groundwater Pump & Treat and Off-Property Groundwater Plumes Monitored Natural Attenuation [2]	$462,000	$91,000	$16,770,006
2a	On-Property Groundwater Pump & Treat and Off-Property Groundwater Pump & Treat [2]	$1,636,000	$175,000	$3,890,000
3	Groundwater VOC Source Treatment and Off-Property Groundwater Plumes Monitored Natural Attenuation	$740,000	$46,000	$1,289,000
3a	Groundwater VOC Source Treatment and Off-Property Groundwater Pump & Treat	$1,899,000	$129,000	$3,327,000
4	On-Property Groundwater Pump and Treat, Groundwater VOC Source Treatment w. Chemical Oxidation, and Off-Property Groundwater Monitored Natural Attenuation [2]	$1,123,000	$92,000	$2,024,000
4a	On-Property Groundwater Pump and Treat Groundwater VOC Source Treatment w. Chemical Oxidation, and Off-Property Groundwater Pump and Treat [2]	$2,262,612	$175,000	$3,919,000
4b	On-Property Groundwater Pump and Treat, Groundwater VOC Source Treatment w. Dual Phase Extraction, and Off-Property Groundwater Monitored Natural Attenuation [2]	$764,000	$146,000	$2,109,000

Notes:

1. Net Present Worth costs are based on a 30 year life of the project for Alternatives 2 and 2a, a 20-year life of the project for Alternatives 3 and 3a, and a 15-year life of the project for Alternatives 4 and 4a.
2. All costs are rounded to the nearest thousand dollars.
3. In the event that one or more of the private wells in either Blackhawk Acres or in the Village becomes affected by one of the VOC plumes, a contingency capital cost of $20,000 should be added for each well that needs to be connected to the municipal water supply. However, a decision on the particular course of action (connection to municipal water supply or the installation of point-of-entry treatment systems) for each affected residence will be made on an individual basis. There are a total of 77 potable water wells in the Village and in Blackhawk Acres. A contingency of $1,530,000 for each active alternative should be considered. These costs are not included in the net present worth costs for each alternative due to their uncertainty.
4. The annual O&M costs include a range to account for the various periodic costs, such as, 5-year review and maintenance costs that occur every few years.

Footnotes:

(1) For purposes of the FS the cost of the no action alternative is considered to be zero. However, there would be costs associated with this alternative, including the abandonment of wells and removal of current remediation systems.
(2) Includes costs for ISCA Extension into Blackhawk Acres Subdivision.

TABLE 2.22

Feasibility Study Alternatives Cost Estimates
Based on 2003 Costs
Alternative 4: On-Property Groundwater Pump and Treat, Source Treatment, and Off-Property Groundwater Monitored Natural Attenuation
Beloit Corporation, Rockton Facility NPL Site
Rockton, Illinois

Task Number	Task	Quantity	Unit	Unit Price	Extended Price
	CONSTRUCTION/CAPITAL COSTS				
1	**Additional Groundwater Monitoring Costs (GW Mgmt Zone)**				
a	Well Drilling Costs	150	VLF	$42	$6,367
b	Access Agreements for Wells	2	EA	$2,122	$4,245
c	Groundwater Management Zone Setup	1	LS	$21,224	$21,224
2	**Source Treatment**				
a	Injection Costs	1	LS	$360,808	$360,808
b	Injection Point Drilling Costs (18 wells at 50 VLF each)	900	VLF	$42	$38,203
c	Drill Cuttings Hauling to Landfill	100	TONS	$21	$2,122
d	Drill Cuttings Disposal	100	TONS	$28	$2,759
e	Performance Sampling Analytical Costs	104	EA	$96	$9,933
f	Performance Sampling Labor Costs	176	HRS	$106	$18,677
3	**ISCA Extension into Blackhawk Acres Subdivision**				
a	Construction Mobilization/Demobilization	1	LS	$5,306	$5,306
b	Additional Groundwater Extraction Well	1	EA	$4,245	$4,245
c	3"/6" double wall HDPE conveyance pipe from new extraction well to treatment building, including trenching, bedding, and backfilling	2,300	FT	$90	$207,465
d	Piping access ports/manholes	3	EA	$2,122	$6,367
e	Additional electric submersible pump	1	EA	$2,653	$2,653
f	Additional electrical requirements - wiring of pumps	1	LS	$5,306	$5,306
g	Additional plumbing requirements	1	LS	$3,184	$3,184
h	Additional process control modifications	1	LS	$3,184	$3,184
i	Access Agreements for new extraction well and piping	3	EA	$5,306	$15,918
j	Construction Oversight	1	DAYS	$1,592	$1,592
	SUBTOTAL CONSTRUCTION CAPITAL COSTS				$726,000
	CONTINGENCY (15%)			$109,000	
	SUBTOTAL				**$835,000**
	INSTITUTIONAL CONTROL COSTS				
4	**On-property GW Control**				
a	Deed Restriction	1	LS	$10,612	$10,612
5	ENGINEERING ACTIVITIES AND DESIGN COSTS (15%)	1	LS	$126,000	$126,000
6	CONSTRUCTION MANAGEMENT COSTS (10%)	1	LS	$84,000	$84,000
7	PROJECT MANAGEMENT COSTS (8%)	1	LS	$67,000	$67,000
	TOTAL IMPLEMENTATION COSTS				$1,123,000

Task Number	Task	Quantity	Unit	Unit Price	Extended Price
	ANNUAL O&M COSTS				
8	Performance Monitoring Costs (analytical & labor) - Years 1 - 5 only				
a	Analytical Sampling Costs	36	EA	$106	$3,820
b	Sampling Labor Costs	48	HRS	$106	$5,094
c	Reporting Costs	70	HRS	$96	$6,686
9	**On-property GW Control**				
a	ISCA Operation & Maintenance Labor Costs	1	LS	$15,918	$15,918
b	ISCA Monitoring Costs (remote)	1	LS	$10,612	$10,612
c	Discharge Monitoring	12	EA	$849	$10,188
d1	Quarterly GW Monitoring Sampling & Reporting Costs (years 6-15)	4	EA	$7,428	$29,714
d2	Quarterly GW Monitoring Sampling & Reporting Costs (years 1-5)	2	EA	$7,428	$14,857
e	Annual ISCA Electrical Costs	50,000	kW-Hrs	$0.11	$5,306
f	Periodic maintenance/repair costs (every 5 years)	1	LS	$7,959	$7,959
10	*Off-property Exposure Control*				
a	GW Management Zone, Well Sampling & Reporting	1	LS	$7,428	$7,428
b	Annual Blackhawk Acres Private Well Sampling Costs (analytical & labor)	1	LS	$5,306	$5,306
11	**Existing Point-of-Entry Treatment System Maintenance Costs (every 5 years)**	4	EA	$1,061	$4,245
12	**5 Year Review Costs**	1	LS	$26,530	$26,530
	SUBTOTAL ANNUAL COSTS YEARS 1 - 5 (not including Tasks 9d1, 9f, 11, and 12)				$85,214
	SUBTOTAL ANNUAL COSTS YEARS 6 - 15 (not including Tasks 9d2, 9f, 11, and 12)				$84,472
13	ANNUAL PROJECT MANAGEMENT (8%)	1	LS	$6,758	$6,758
	TOTAL ANNUAL COSTS YEARS 1 - 5 (not including Tasks 9d1, 9f, 11, and 12)				$92,000
	TOTAL ANNUAL COSTS YEARS 6 - 15 (not including Tasks 9d2, 9f, 11, and 12)				$91,300

Table 2.22 (con't)

Year	Capitol/Construction Costs	O&M Costs	Periodic Costs [2]	Total Costs	7% PNW Factor	Present Net Worth
0	$1,123,000	$0	$0	$1,123,000	1	$1,123,000
1	$0	$92,000		$92,000	0.9346	$85,983
2	$0	$92,000		$92,000	0.8734	$80,353
3	$0	$92,000		$92,000	0.8163	$75,100
4	$0	$92,000		$92,000	0.7629	$70,187
5	$0	$92,000	$38,734	$130,734	0.7130	$93,213
6	$0	$91,300		$91,300	0.6663	$60,833
7	$0	$91,300		$91,300	0.6227	$56,853
8	$0	$91,300		$91,300	0.5820	$53,137
9	$0	$91,300		$91,300	0.5439	$49,658
10	$0	$91,300	$38,734	$130,034	0.5083	$66,096
11	$0	$91,300		$91,300	0.4751	$43,377
12	$0	$91,300		$91,300	0.4440	$40,537
13	$0	$91,300		$91,300	0.4150	$37,890
14	$0	$91,300		$91,300	0.3878	$35,406
15 [1]	$0	$91,300	$53,060	$144,360	0.3624	$52,316
		Total Cost		$2,627,000		
	Total Net Present Worth					$2,024,000

Footnotes:
(1) The year 15 costs include costs for closure activities and reporting.
(2) Periodic costs include closure costs (see footnote 1) and the annual costs for Tasks 9f, 11, and 12.

General Notes:
1. Present Net Worth (PNW) cost is based on a 7% discount rate.
2. A 15 year lifetime is assumed for this Alternative to provide cleanup and closure for the site.

Table 2.23

Cleanup Levels for Chemicals of Concern

Media: Groundwater
Site Area: Beloit Corporation Property[1], Blackhawk Acres Subdivision[2], and Village of Rockton[3]
Available Use: Residential
Controls to Ensure Restricted Use (if applicable):

Chemical of Concern	*Cleanup Level*	*Basis for Cleanup Level*	*Risk At Cleanup Level*
1,1-Dichloroethene	0.007 mg/L	Compliance with State ARARs (35 IAC 620.410)	NA
1,2-Dichloroethane	0.005 mg/L	Compliance with State ARARs (35 IAC 620.410)	NA
Carbon tetrachloride	0.005 mg/L	Compliance with State ARARs (35 IAC 620.410)	NA
Trichloroethene	0.005 mg/L	Compliance with State ARARs (35 IAC 620.410)	NA
Tetrachloroethene	0.005 mg/L	Compliance with State ARARs (35 IAC 620.410)	NA

Key

ARARs = Applicable Relevant and Appropriate Requirements
mg/L = Milligrams per liter
NA = Not applicable

[1]The results of the Baseline Risk Assessment (BLRA) indicated an estimated excess cancer risk of 7×10^{-3} and a Hazard Index of 49 for an on-site resident using groundwater for domestic purposes. Primary cancer risk drivers were 1,1-dichloroethene, 1,2-dichloroethane, and tetrachloroethene. Non-cancer risk drivers included 1,2-dichloroethane and tetrachloroethene.

[2]The BLRA indicated an estimated excess cancer risk of 1.6×10^{-4} a resident of Southern Blackhawk acres Subdivision using untreated groundwater for domestic purposes. Risks were due to 1,1-dichloroethene and tetrachloroethene.

[3]The BLRA indicated an estimated excess cancer risk of 2.8×10^{-4} for a Village of Rockton resident using groundwater from a private well hypothetically contaminated with COCs detected in on-site well W47C in the future. Risks were due to 1,1-dichloroethene, carbon tetrachloride, and trichloroethene.

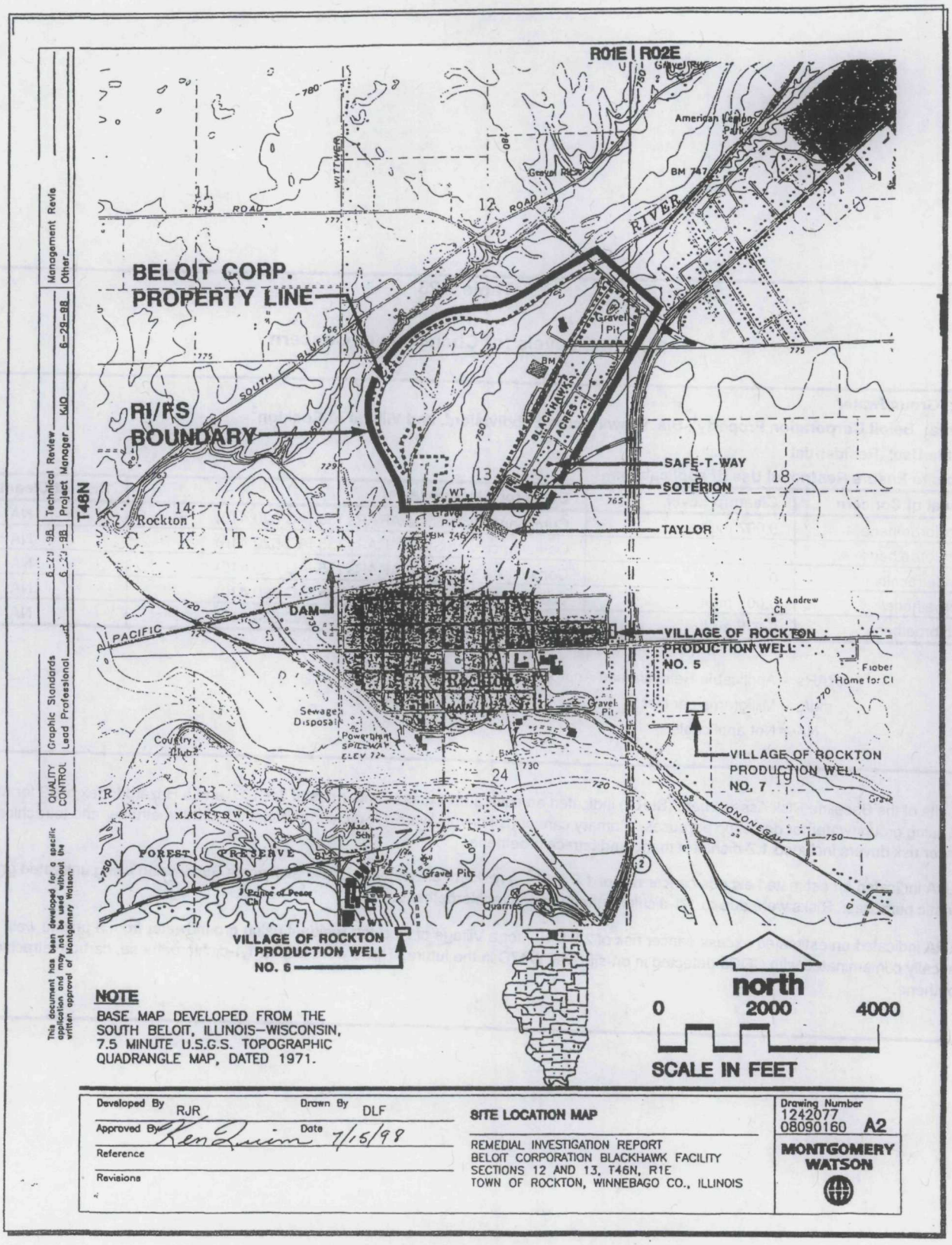

Figure 1 Site Location Map

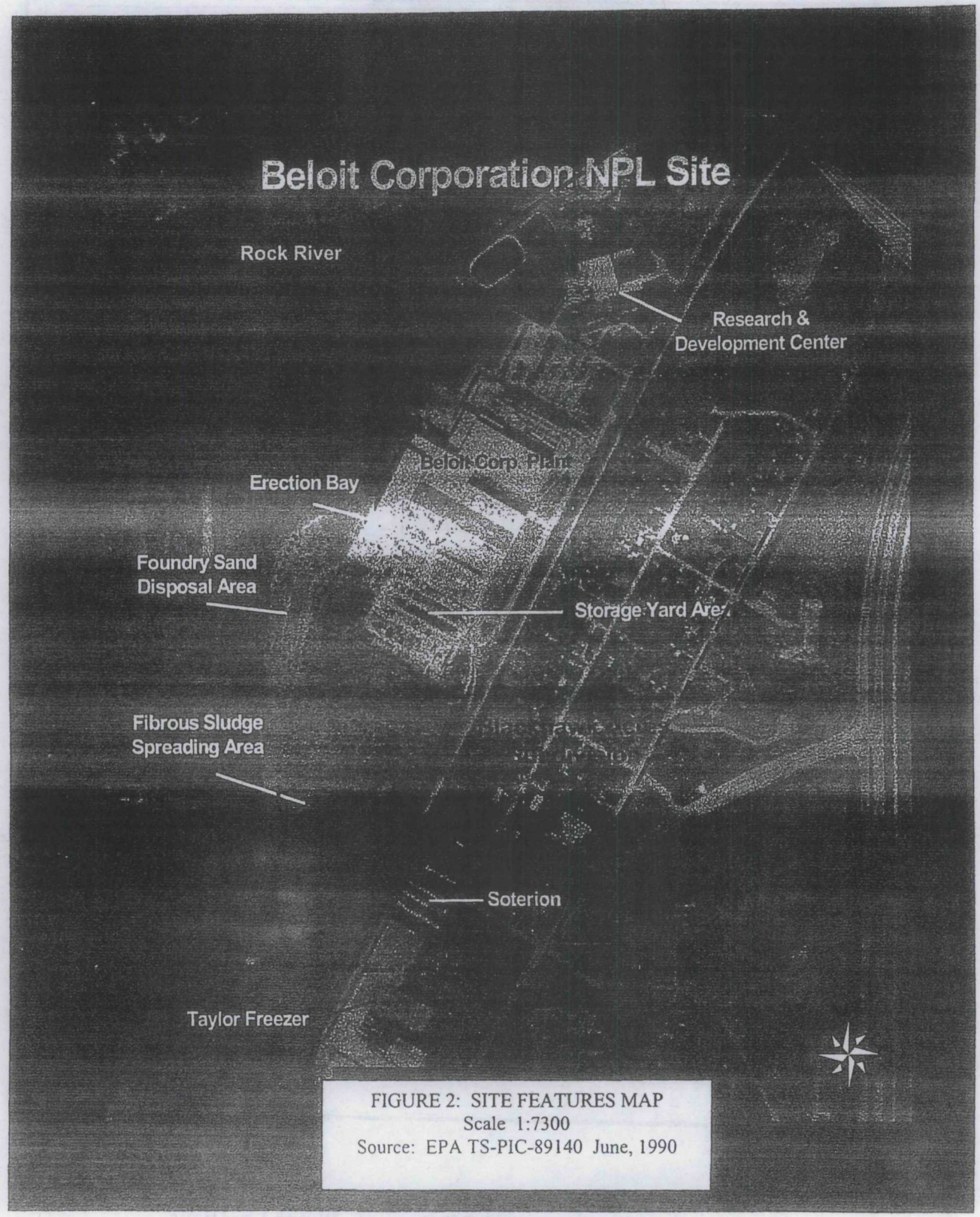

FIGURE 2: SITE FEATURES MAP
Scale 1:7300
Source: EPA TS-PIC-89140 June, 1990

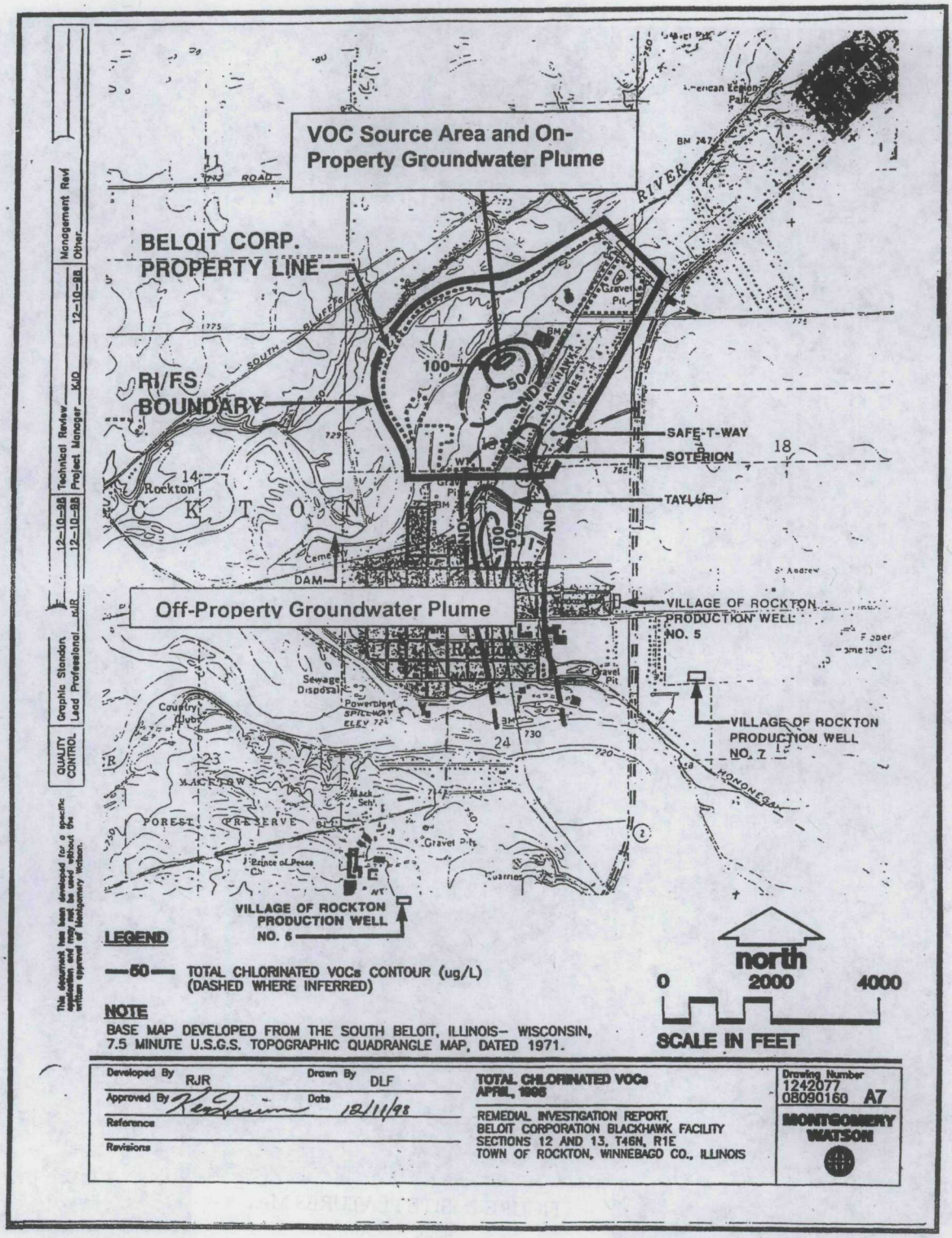

Figure 3. On-Property and Off-Property Plume Locations

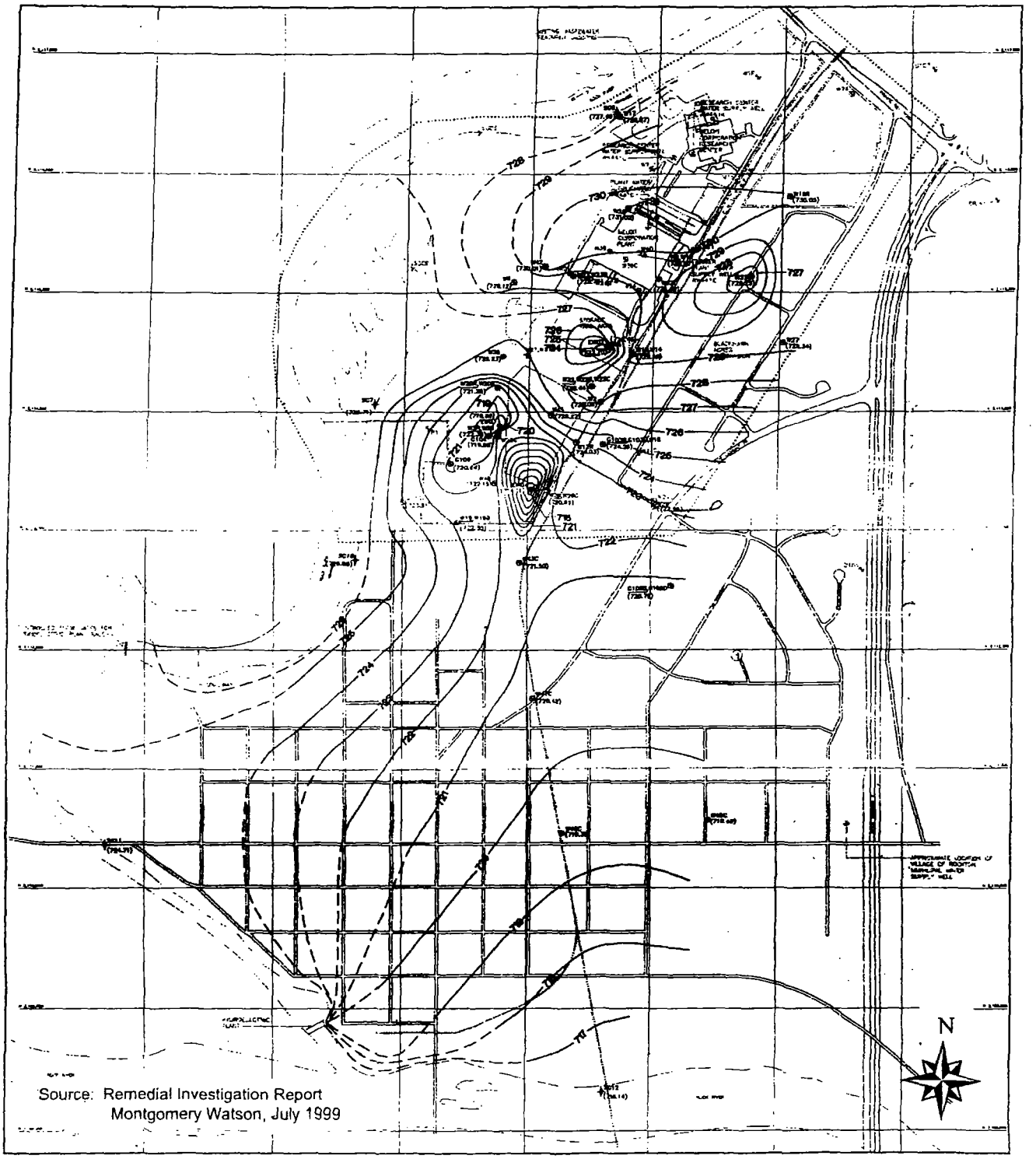

Figure 4 Water Table Map

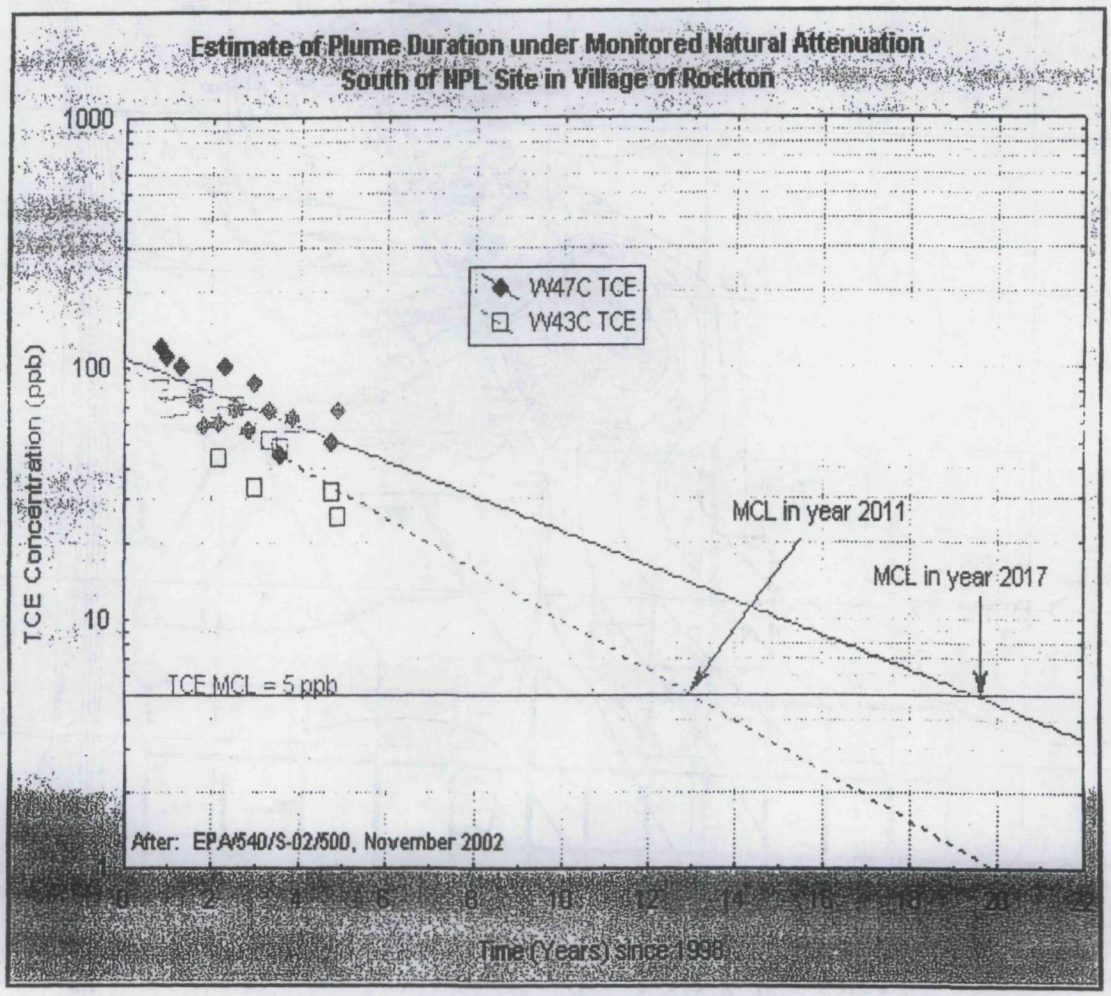

Figure 5 Estimate of Off-Property Plume Duration

Appendix A

BELOIT CORPORATION SUPERFUND SITE

ROCKTON, WINNEBAGO COUNTY, ILLINOIS

FINAL REMEDY

RESPONSIVENESS SUMMARY

September 2004

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RESPONSIVENESS SUMMARY

Responsiveness Summary Overview

In accordance with CERCLA Section 117, 42 U.S.C. Section 9617, the Illinois Environmental Protection Agency (Illinois EPA) held a public comment period from March 19, 2004 through May 24, 2004, to allow interested parties to comment on the proposed plan (March 2004) for this site. The original public comment period ending on April 23, 2004, was extended due to a citizen request. The proposed plan identifies the cleanup alternatives and preferred option for the final remedy at the Beloit Corporation Superfund Site in Rockton, Illinois. The proposed plan was issued by the Illinois EPA, the lead agency for site activities, and the United States Environmental Protection Agency (USEPA), the support agency for this remedial action. Illinois EPA, in consultation with the USEPA, has selected a final remedy for the site now that the public comment period has ended and written and oral comments have been submitted. The remedy is detailed in Illinois EPA's Record of Decision (ROD) with which the USEPA concurs.

The purpose of this responsiveness summary is to document the Illinois EPA's responses to questions, concerns, and comments received during the comment period and during the public hearing. These comments and concerns were considered prior to selection of the final remedy for the site. A complete copy of the proposed plan, administrative record, and other pertinent information are available at The Talcott Free Library, 101 East Main Street, (815/624-7511).

Site Location and History

The Beloit Corporation Superfund Site is located in Rockton Township, Winnebago County, in north central Illinois. The site lies in a mixed industrial and residential area adjacent to and within the Village of Rockton. It is bounded on the north by Prairie Hill Road, on the west by the Rock River, on the south by an access road from the Rock River to Blackhawk Boulevard, and on the east by Blackhawk Boulevard. The site area includes Beloit Corporation property, the neighboring Blackhawk Acres subdivision, the former Soterion/United Recovery facility (Soterion), a portion of the Taylor, Inc. property, and the Safe-T-Way property.

The Beloit Corporation began operations in 1957 as a manufacturer of paper-making machines that produce layered paper products from paper pulp. Solvents were used at the plant for parts cleaning operations. *Non-chlorinated* solvents were used at the facility until the mid 1970's. From the mid 70's until 1983, *chlorinated* volatile solvents were used. Currently the facility is closed pending transfer to other industrial uses.

Between 1980 and 1982, the Illinois EPA conducted several investigations at Soterion in response to complaints from local residents. These investigations led the Illinois EPA to conduct a groundwater quality study of private water supply wells located in nearby Blackhawk Acres subdivision. The principal results of these analyses showed that three private wells on the southern end of Watts Avenue contained *1,1,1-Trichloroethane* (1,1,1-TCA) and *Tetrachloroethene* (PCE) at concentrations exceeding the *USEPA Maximum Contaminant Levels* (MCLs), with low concentrations of other volatile organic compounds (VOCs). These results led to several subsequent investigations in the vicinity of Soterion and Beloit Corporation property by the Illinois EPA and Beloit Corporation. These investigations included sampling of wastewater and sludge from the Beloit Corporation Research Center, groundwater monitoring wells, surface soil and soil gas. The results of these studies indicated that VOCs were present in groundwater in several areas on Beloit Corporation property and in the subdivision and Soterion. However, the source of VOCs could not be defined to one location.

In August 1990, the USEPA placed the Beloit Corporation site on the *National Priorities List* (NPL) or *Superfund* List. In May 1991, Beloit Corporation entered into a Consent Decree with the Illinois EPA to conduct a Remedial Investigation/Feasibility Study. Four phases of investigation were conducted by Beloit Corporation with Illinois EPA oversight between July 1992 and January 1998. The objective of the investigations was to define the nature and extent of soil, groundwater, surface water, and sediment contamination on Beloit property and in off-property areas, and to identify the source of VOC contaminants.

In June 1999, Beloit Corporation filed for bankruptcy. In July 2001 the Beloit Liquidating Trust became the owner of all of the remaining liabilities and assets of Beloit Corporation, including the Rockton property. In April 2002, a Prospective Purchase Agreement (PPA) under Section 122h of *CERCLA* was signed between the USEPA and a potential purchaser of the property.

The Illinois EPA installed carbon filter treatment units on four residential private water well supplies that contained VOCs in excess of MCLs. These units were placed at three residences on Watts Avenue and one on Blackhawk Avenue. These systems have been maintained and monitored since installation in 1993 by the Illinois EPA.

In July 1996, a groundwater pump and treatment system (also referred to as the Interim Source Control Action), located in the southeastern corner of the Beloit Corporation property, was installed by Beloit Corporation for groundwater containment within their property. The pump and treatment system has been in continuous operation since that time. In 1998, another private water supply well, located on Blackhawk Drive (in the Village of Rockton) was also found to have VOCs exceeding MCLs. This residence was connected to the Village of Rockton municipal water supply in 1999.

The Illinois EPA's Remedial Investigation (RI) was completed in 1999. The RI results indicate soil and groundwater at the Beloit Corporation property is contaminated as a result of on-site handling and release of solvents during manufacturing. 1,1,1-TCA, PCE, *Trichloroethene* (TCE), and 1,2-Dichloroethene (1,2-DCE) were detected in soil and groundwater. The complete RI details sources, sample results, and groundwater plumes and can be found on microfiche in the administrative record.

Summary of the Final Remedy

Based on the information collected to date on soil and groundwater contamination and associated risks to human health and the environment, the Illinois EPA recommends **Alternative 4** (detailed in the proposed plan) for cleaning up the Beloit Corporation NPL site. Alternative 4 includes on-property groundwater pump and treat, VOC source treatment by chemical oxidation, off-property groundwater plumes monitored natural attenuation, and institutional controls. This recommended alternative is believed to provide the best balance among the alternatives with respect to the nine evaluation criteria developed by the USEPA. The nine criteria address the technical, cost, and statutory considerations that must be evaluated prior to the selection of appropriate remedial actions at Superfund sites.

Public Hearing

Illinois EPA solicited input from the community on the cleanup methods and proposed final remedy. Prior to the final remedy, the Illinois EPA was required to hold a minimum 30-day public comment period to encourage public participation in the selection process. The comment period was held from March 19, 2004 through May 24, 2004, to allow interested parties to comment on the proposed plan (March 2004) for this site. The original public comment period ending on April 23, 2004, was extended due to a citizen request.

Illinois EPA held a public hearing to explain the proposed plan and the alternatives and to accept oral comments on April 7, 2004, at the Hononegah Performing Arts Centre in Rockton, Illinois.

A notice of the public hearing was published in the Rockton Herald on March 18 and 25, and April 1, 2004. Copies of the proposed plan and the notice of the hearing were sent to legislators, elected officials, and interested citizens. A fact sheet summarizing the proposed plan and the alternatives and announcing the public hearing was sent to citizens, media, and local officials.

Beloit Corporation Responsiveness Summary Comments and Questions

Preferred Remedy Comments/Questions

Comment:
It is recommended that the final cleanup plan to be specified in the Record of Decision (ROD) to allow for either chemical oxidation or bioremediation (i.e. biologically induced ERD) to achieve in-situ treatment of source area soil and groundwater by the erection bay.

Response:

Multiple technical documents (including, but not limited to, the Remedial Investigation Report, risk assessment, and the feasibility study) were reviewed to compare all available technologies for this site. The Illinois EPA compiled an administrative record (available at The Talcott Free Library) utilizing numerous references and correspondences to complete the recommendation for the site. After extensive review, it was determined that chemical oxidation was the preferred alternative to be compliant with the nine criteria set by the National Contingency Plan (NCP).

These nine criteria include: Overall Protection of Human Health and the Environment; Compliance with Applicable or Relevant and Appropriate Requirements (ARARs); Long-term Effectiveness and Permanence; Reduction of Toxicity, Mobility or Volume Through Treatment, Short-term Effectiveness; Implementability; Cost; Support Agency Acceptance; and Community Acceptance.

Compliance with the nine criteria lead Illinois EPA and U.S.EPA to conclude that Alternative #4 would provide the highest degree of protection of human health and the environment, afford for a diminutive amount of time to remediate, and be cost effective.

Comment:
Beloit Corporation constructed a building over the pollution source area. The pollution will continue as long as this source area remains.

Response:

This building was constructed before it was determined where the source area was located. The proposed alternative is designed to remediate the source area under the building until only residual contamination below action levels remain and then, monitoring will continue until natural attenuation occurs further reducing contaminants to non-detectable limits. This is predicted to occur within15 years of implementation.

Comment:
Carbon filter treatment units may work today, but there is no guarantee that they will work tomorrow.

Response:

The Illinois EPA monitors these residential filter systems on an annual basis to ensure their efficiency. Once the final remedy is implemented and the groundwater reaches acceptable drinking water standards and, if requested by the homeowner, these carbon treatment units will be removed. These filter systems were

installed as an interim remedy for the homeowners private wells that exceeded drinking water standards; they were not intended as the long-term solution.

Comment:
The on-going "pump and treat" system (the interim source control action) consumes 8,000,000 gallons of groundwater each month. This large volume of water is stressing the water supply and placing the private and public wells in the area in jeopardy.

Response:

The current pump and treat system on-site has a capture zone which receives the majority of groundwater from the Rock River. The cone of depression around each on-site extraction well only extends a short distance from each extraction well to the Beloit Corporation property line. There is a network of monitoring wells on and around the site used to measure groundwater levels on a quarterly basis. This network shows that residential wells are recharged from grpundwater that flows through the neighborhood from the east. Therefore, the on-going pump and treat system shows no adverse effects on private residential wells or public well water levels. All the information about how the pump and treat system works, how groundwater flows, and their influences on each other can be found in the administrative record located in The Talcott Free Library.

Comment:
The preferred remedy is a "band aid" approach to this problem for the next 7-15 years.

Response:

The preferred remedy is intended to bring back the groundwater to an unrestricted beneficial use where no further remediation is required. One of the ultimate goals of a Superfund project is to have the site de-listed from the National Priorities List of CERCLA. Alternative #4 will provide the best opportunity to achieve this goal within the least amount of time.

Comment:
The Illinois EPA did not explain all eight alternatives at the public hearing; Alternative 4 was the only option explained at length. This left most everybody at the meetings thinking that this is what the EPA was going to do.

Response:

The purpose of the public hearing was to provide Illinois EPA an opportunity to present the alternative that the Illinois EPA and U.S.EPA believes to be best for the cleanup of the contaminated soil and groundwater at the Beloit Corporation Superfund site. If all eight alternatives evaluated for the site were fully presented, the hearing would be extremely lengthy. This is why a 30-day public comment period (in this case because of a citizen request, an extension provided for a 60-day comment period) is offered; so that the public can review all the pertinent information, ask multiple questions pertaining to the recommended alternative or any of the non-recommended alternatives, and receive informative answers.

All eight alternatives were detailed in the Feasibility Study and explained in the Proposed Plan that was available for public review at the Beloit Corporation Superfund Site Administrative Record/Information Repository (located at Talcott Free Library) and at this public hearing. The availability of the Proposed Plan was announced through a public notice in The Rockton Herald newspaper for three consecutive weeks and a fact sheet was sent to Blackhawk Acres Subdivision and nearby residents, local officials, and media contacts.

Financial Comments/Questions

Comment:
There is economic evidence to suggest public water service connection for everyone within the Superfund site boundaries would be cheaper than the current preferred remedy.

Response:

The current preferred remedy includes a contingency for public water supply service connections for all homes in the Blackhawk Acres Subdivision. Based on the best available data, it is highly unlikely that any new homes will show contamination from the Beloit Corporation source in the future. The three homes that presently have contamination above the maximum contaminant levels are showing a steady decline in contaminant concentrations. Once the remedy is implemented, contaminant levels should be reduced to below maximum contaminant levels throughout the area, including the Beloit Corporation property within 15 years. However, the Illinois EPA wanted a contingency to ensure safe drinking water for all residents in the Blackhawk Acres Subdivision if the current conditions changed.

Question:
Has a cost benefit analysis been performed, comparing the projected annual testing versus hooking up residents to public water? If so, what are the results?

Answer:

The decision to provide public water service connections will be based on the potential risk associated with actual exposure to contaminated groundwater. If (based on testing) a resident receives a correspondence from the Illinois Department of Public Health stating they should seek an alternate water supply based on risk from exposure to groundwater attributable to the site, three options under the contingency plan will go into place and the resident may choose to: (1) connect to the public water service provided by the Village of Rockton (paid for by the U.S.EPA special account set up for this site); (2) be provided a carbon treatment system on their private water well (paid by the U.S.EPA special account) until risk is reduced to acceptable levels, or (3) affected residents may choose to do nothing or seek independent un-reimbursable relief (i.e., bottled water).

However, there are numerous safeguards built into the on-going monitoring plans for the site. If groundwater conditions change dramatically and it becomes apparent the private residential well may become impacted by the plume, the agencies can take corrective actions (i.e., increase capture of the plume by the pump and treat system, increase frequency of residential well sampling, addition of different oxidizing agents to breakdown the sources) to correct or protect the potentially influenced home(s). A cost benefit analysis comparing the projected annual testing versus hooking up residents to public water was not performed as part of the FS for the Site. The remedial alternatives were developed to provide protection of human health and the environment and to eventually meet the goal of restoring groundwater to its beneficial uses. Just hooking people up to City water may or may not be protective, but it would not do anything to restore groundwater.

Comment:
The money in the Beloit Corporation's trust fund should be used to hook up the residences in Blackhawk Acres subdivision to public water.

Response:

The special account was established by the bankruptcy court in the amount of 2.7 million dollars to pay for remedial actions at the site. This special account is intended to be used for implementation of source removal

at the facility, continued operation of the pump and treat system, and the on going monitoring of the area. In addition, the new Beloit property owner has issued a letter of credit of 3.0 million dollars to cover potential cost overrides at the site, if remedial actions exhaust funds in the special account.

A contingency plan is being proposed in the ROD to provide alternatives in the event conditions change before the remedy is fully implemented. There are different mechanisms which may pay the cost of the contingency, if deemed necessary. One of the options under the contingency plan is to provide individual homeowners an option to hookup to the Village of Rockton's public water system if the home is shown to be at potentially unacceptable risk levels from exposure to contaminants attributable to the site. As stated in the proceeding response, U.S.EPA and Illinois EPA would require justification (such as potential exposures) to provide funding for water service connection for this CERCLA action. If there is no potential or actual threat at a residential well location, and there is no scientific evidence to suggest that exposures will occur in the future at this location, then there is no statutory requirement or Superfund policy initiative that would direct the Illinois EPA or USEPA to connect residents who have unaffected private wells.

Groundwater Contamination Comments/Questions

Comment:
Changing weather conditions and usage will affect the paths of the pollution and endanger more wells.

Response:

Normal weather variations have had and would have little affect on groundwater conditions at the site. An extraordinarily severe weather condition, which is both critical and prolonged, may have the ability to alter groundwater conditions, but this scenario is highly unlikely within the time frame it will take to remediate the site. Groundwater pathways have remained relatively unchanged in the last 15 years of monitoring. Any new wells (private or public) placed in the area would be scrutinized to ensure no adverse affects would occur to present day conditions.

Comment.
The Village of Rockton s public wells are in danger of potential contamination. Therefore, the Village **should be connected to a new well up gradient well. Homes should not be hooked up to the existing Rockton wells.**

Response:

Only one of Rockton's municipal wells, Rockton Municipal Well #5, is located near the Beloit groundwater VOC plume. This well has never shown detectable levels of contaminants attributed to the site. Illinois EPA has included Municipal Well #5 for sampling of VOCs during annual residential well sampling. There is also a sentry monitoring well in-place between the plume and the municipal well. This monitoring well is sampled quarterly and is designed to provide an early warning should groundwater conditions change in a manner that threatens the municipal well. It has never shown detectable levels of contaminants.

Also, the Municipal Well # 5 recharge zone (area where groundwater is captured) is shown to be to the northeast. The VOC plumes from the Beloit Corporation NPL site pass approximately 1,500 feet west of Municipal Well #5 as they migrate to the Rock River. The predicted 5-year recharge zone for Municipal Well # 5 extends to the northeast of the site and would have no predictable influence on the VOC plume. Of course, this Municipal well will be monitored continually throughout the project.

Comment:
A community well should be dug northwest of Blackhawk Acres subdivision.

Response:

It would be impracticable in terms of cost, implementability, and operation and maintenance to "dig" another well to be privately administered. This alternative was originally explored, but was not retained as an option since there is a public potable water supply readily available through the Village of Rockton.

Comment:
Residents in the Blackhawk Acres subdivision are drinking potentially hazardous water; several wells found safe in the past are now showing contamination.

Response:

Any home showing elevated levels of contaminants, which the Illinois Department of Public Health has deemed to be at unacceptable risk level, have been provided with carbon filtration systems to prevent exposure to potentially hazardous conditions. These systems are monitored on annual basis to ensure effectiveness. There are numerous safeguards to ensure private wells will not become exposed to potential contamination. These safeguards include, but are not limited to: monitoring wells between the plume and the residential neighborhood, groundwater modeling to ensure groundwater on-property capture, and the pump and treat system monitoring and maintenance to ensure proper treatment and disposal.

Comment:
Annual Illinois EPA monitoring of private water wells for a number of years could result in a full year of drinking contaminated water before detection. Since the Illinois EPA only collects samples in the spring, contamination during other times of the year may be missed. Drinking water samples should be collected at times throughout the year that coincides with the seasonal groundwater fluctuations.

Response:

Sampling of a network of monitoring wells is done on a quarterly basis. Many of these wells are located between the plume and Blackhawk Acres Subdivision. Based on previous groundwater flow direction data and predicted groundwater paths it is unlikely that any previously uncontaminated homes will become contaminated with VOCs in the future. The quarterly sampling of monitoring wells will continue throughout remediation and should provide an early warning for any changes in groundwater flow conditions and quality.

Comment:
The nature of the contamination is such that these residents very possibly have been exposed to volatile organic chemicals through groundwater, soil and air contamination since 1980, when IEPA commenced water testing.

Response:

Illinois EPA and Beloit Corporation signed a consent decree to conduct a Remedial Investigation (RI) at the site in 1991. The investigation required Beloit Corporation produce quality assurance/quality control documents for sampling and analyses as outlined by U.S.EPA guidance, which provided for the highest data quality levels achievable. It was during the first round of sampling in 1992 that defensible data showed contaminants in private drinking wells above

MCLs. Illinois EPA immediately sought funding for an interim action to protect affected homes until a permanent final remedy could be implemented for the site. The interim action acceptable to the affected homeowners was the installation of dual tank carbon treatment systems on their private water well connection. These systems were installed in 1993 and have continually been monitored and maintained by Illinois EPA. Without defensible data, it is impossible to predict if and when exposure may or may not have occurred.

Proposed Plan Comments/Questions)

Comment:
On-Property terminology indicates that it means "on the Beloit Corporation property". It was recommended the use of "On-Site" or similar vernacular, to indicate "Beloit Corporation Superfund boundaries", which includes the Blackhawk Acres subdivision.

Response:

The terminology is used to differentiate areas of active remedial actions and passive corrective actions. A groundwater management zone (GMZ) is a hypothetical area under State of Illinois statutes, which extends from the VOC source areas and encompasses the entire VOC plume (on a 3-dimesional spatial volume). The GMZ would restrict use of groundwater and monitors groundwater quality and conditions while remedial efforts are being conducted. The GMZ is being considered for all on-property and off-property actions with contingencies. The on-property zones will be remediated using an active combination of a pump and treat system (currently in-place) and aggressive source remediation (proposed chemical oxidation). Without any new VOC source material (no new releases from the site) the off-property plume will naturally degrade until acceptable levels are observed (predicted to occur within 15 years). It is anticipated that the GMZ will gradually decrease in size as the plume diminishes until the only area requiring long-term remedial efforts will be the on-property section. This will allow passive remediated off-property areas the potential to be released from site activities sooner than on-property actions.

Comment:
The proposed Alternative 4 action is too restrictive in allowing only the three residential homes on carbon filtration systems in Blackhawk Acres subdivision to be considered "for new, deeper wells or provision of a municipal water supply if chemicals of concern still exceed standards after a 5-year **review period". It was recommended that all the homes within the Beloit Corporation Superfund site boundaries should be included in the contingency action if chemicals of concern exceed the MCLs.**

Response:

All private wells shown to be contaminated with the chemicals of concern which are attributable to the Superfund site and receive correspondence from Illinois Department of Public Health informing the homeowners to seek an alternative water supply will be eligible for contingency actions under the Record of Decision.

The 5-year review period is used every five years to re-evaluate applicable or relevant and appropriate (ARARs) requirements selected in the ROD and to make certain the remedy is still relevant and effective.

Indoor Air Testing Comments/Questions

Comment:
It is recommended that indoor air testing be done to determine whether the residents of the Blackhawk Acres subdivision are being exposed to VOCs from contaminated groundwater vapors entering their homes through cracks in the foundation or through crawl spaces.

Response:

Contamination from the off-property plume is at low concentrations (<100 parts per billion [ppb]) and calculating the site-specific variables against the Johnson & Ettinger models (USEPA; *Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils)* shows no adverse infiltration risk affecting potentially influenced areas. Using these models, along with the depth (>25 ft below ground surface [bgs]) of groundwater, the speed at which groundwater is traveling through the area, and the decreasing trends exhibited by the off-property plume, it is predicted that potential vapor intrusion into area homes is unlikely and poses a negligible risk to individuals.

Village of Rockton Public Water Hook-ups Comments/Questions

Comment:
The public water main extension should be available to homeowners on both Watts Avenue and Blackhawk Blvd.

Response:

It is the Agency's understanding that the Village of Rockton water main extension is available to everyone on Watts Avenue. Illinois EPA has discussed with the Village of Rockton potential water line extensions into other areas of Blackhawk Acres Subdivision (i.e., Blackhawk Boulevard) if the contingency plan became necessary under the guidelines of the ROD. A conservative estimate of approximately $20,000 per household was used for the ROD contingency in the event it became necessary to connect affected private wells on and off the Superfund site (approximately 77 potential homes). This contingency cost would most likely include the Village of Rockton water main extension (if not currently available), connection to the affected home(s), and the abandonment of the existing private well. Water usage charges and any future maintenance requirements would become the responsibility of the homeowner.

Comment:
Residents should not be forced to annex into the Village if they decide to hook up to the public water supply. Many residents are on fixed incomes and annexing into the Village would raise their taxes.

Response:

The Village of Rockton has offered water connection without annexation. A resident would however have to pay an increased service fee (1.5 times actual units) for water. This is not uncommon for municipalities to provide this service to unincorporated areas; and if a Blackhawk Acres Subdivision property is not contiguous to a Village of Rockton property, it may not be possible to annex anyway.

Question:
Will the Illinois EPA allow homeowners to decide to be hooked up to public water?

Answer:

Anyone who has access to the service connection on Watts Avenue has been given the opportunity to connect to the Village of Rockton's public water supply. It is important to remember that unless the criteria for the ROD contingency plan has been confirmed through approved sampling, the U.S.EPA will not reimburse fees for homeowners's who voluntarily choose to do the connection themselves.

Question:
If the homeowner living on Watts Avenue has already paid for the hook-up to public water supply, will he/she be reimbursed by the Illinois EPA?

Answer:

Unless the criteria for the ROD contingency plan has been confirmed through approved sampling, the U.S.EPA will not reimburse fees for homeowners who voluntary choose to do the connections themselves

Other Superfund Site Remedies Comments/Questions

Comment:
Evergreen Manor and SE Rockford Superfund sites agreed to do indoor air testing to rule out the possible contamination from VOC vapors entering the homes.

Response:

The RI/FS for Evergreen Manor began in 1999 with a ROD in 2003 and the RI/FS for the Southeast Rockford began in 1989 and continued until the latest ROD at the Site in June of 2002. The USEPA's publication of the Vapor Intrusion Guidance did not take place until November of 2002. Since the RI/FS work at both of these other Sites was already underway, and there was no USEPA published guidance available prior to November 2002, a decision was made during project planning to conduct indoor air sampling in order to determine whether the vapor intrusion pathway was complete and, if so, whether the completed pathway posed an unacceptable risk to human health.

Since the final phases of the remedial investigation for the Beloit Corporation Superfund Site were completed after November 2002, the Illinois EPA had the benefit of the published guidance document whereas the other two sites mentioned, did not. The draft guidance begins with simple and generally reasonable conservative screening approaches and gradually progresses toward a more complex assessment involving increasingly greater use of site-specific data. Of those sites determined to have an incomplete vapor intrusion pathway, further consideration of the current site situation (i.e., indoor air sampling) generally should not be needed. During the preparation of the Feasibility Study for the Beloit Corporation Superfund Site, the Site specific information was plugged into the screening model provided in the Vapor Intrusion Guidance and it was determined that the Site did not present an unacceptable risk of exposure from vapor intrusion, so indoor air sampling was not conducted.

Comment:
The residents living in Evergreen Manor subdivision (Roscoe, Illinois) were hooked up to safe public water; the residents in Blackhawk Acres subdivision should also be hooked up to safe water.

Response:

The residents in Evergreen Manor were connected to public water supply based on the actual or potential threat posed by the modeled contaminant plumes within the subdivision. There were homes in the area that did not meet this criterion and were not offered hookup. Also, no active remediation was being conducted on the source areas of contamination and therefore no reduction in plume size or contaminant recharge was being achieved.

Question:
How many homes, having had no detections, at the Southeast Rockford Superfund site were still hooked up as part of the cleanup?

Answer:

Hookups were provided to homes in Southeast Rockford based primarily on contaminant plume modeling. Homes that were predicted through modeling (not sampling) to show potential threat of contamination were offered public water supply hookups. Since the modeling showed an extensive area of contamination, some homes were provided hookups without ever being sampled based on potential threat. Since the area of contamination is well defined at the Beloit Corporation Superfund site, the potential threat has been projected, an active remediation is being currently conducted at the site and contingencies are proposed, the Illinois EPA has no scientific rationale to connect homes to public water.

Question:
In other Illinois Superfund sites, how many homes have been hooked up to public water to prevent possible contamination? If this has been done at other Superfund sites, why or why not wouldn't this be applicable at this site?

Answer:

Without an actual or potential threat of contamination to a private water well, there is no scientific or statutory basis to connect any residence in the State of Illinois to public water supplies using Superfund monies.

For Further Information

Questions about the hearing process and about access to exhibits should be directed to Paul Jagiello, Illinois EPA Hearing Officer, Illinois EPA, Division of Legal Counsel, 9511 W. Harrison St., Des Plaines, Illinois 60016.

Questions about the proposed plan and final remedy should be directed to Eric Runkel, Remedial Project Manager, Illinois EPA, Bureau of Land, 1021 North Grand Avenue East, P.O. Box 19276, Springfield, Illinois 62794-9276, or phone at 217/782-6761.

Questions about the Illinois EPA's enforcement activities should be directed to Paul Jagiello, Illinois EPA, Division of Legal Counsel, 9511 W. Harrison St., Des Plaines, Illinois 60016.

Questions about the responsiveness summary should be directed to Michelle Tebrugge, Illinois EPA, Community Relations Coordinator, 1021 North Grand Avenue East P.O. Box 19276, Springfield, Illinois 62794-9276, or phone at 217/524-4825.

All documents used by Illinois EPA in formulating the proposed plan and all of the alternatives for this site are contained in the site Administrative Record at the Talcott Free Library, 100 East Main, Rockton, Illinois.

Additional copies of this responsiveness summary are available from Michelle Tebrugge, Illinois EPA, Community Relations Coordinator, 1021 North Grand Avenue East P.O. Box 19276, Springfield, Illinois 62794-9276, or phone at 217/524-4825.

GLOSSARY

Specialized terms and acronyms that are used in this responsiveness summary and the proposed plan are detailed below.

Administrative Record (*AR*) - a file that is maintained, and contains all information used by the lead agency to make its decision on the selection of a response action under CERCLA. This file is to be available for public review and a copy established at or near the site, usually at one of the Information Repositories.

ARARs (Applicable or Relevant and Appropriate Requirements) - *Applicable* requirements are those cleanup standards, standards of control, and other substantive environmental protection requirements, criteria, or limitations promulgated under Federal or State law that specifically address a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance at a CERCLA site. *Relevant and Appropriate* requirements are those same listed standards that while not applicable at the CERCLA site, address problems or situations sufficiently similar to those encountered at the site that their use is well suited to the particular site.

CERCLA (*Comprehensive Environmental Response, Compensation and Liability Act or Superfund*) - a Federal law passed in 1980 and modified in 1986 to create a special tax that goes into a Trust Fund, commonly known as *Superfund*, to investigate and take remedial action at abandoned or uncontrolled hazardous waste sites.

Chlorinated – *containing chlorine.*

Community Relations Plan (CRP) - a plan that is prepared at the start of most Superfund response activities to direct activities that will allow the community affected by the site to be kept informed of USEPA, Illinois EPA, and PRP activities.

Cone of Depression - A depression in the potentiometric surface of a body of groundwater, which has the shape of an inverted cone and develops around a well from which water is being withdrawn.

1,2-Dichloroethene (1,2-DCE) – a volatile organic compound (VOC).

Engineering Evaluation/Cost Analysis (*EE/CA*) - performed to evaluate removal actions in terms of their effectiveness, implementability, and cost.

Groundwater - *underground water that fills pores in soils or openings in rocks to the point of saturation.*

Groundwater Management Zone (*GMZ*) - a three-dimensional region containing groundwater being managed to mitigate impairment caused by the release of contaminants from a site.

Maximum Contaminant Level (*MCL*) - a concentration established by the USEPA for specific chemicals in drinking water supplies that may cause adverse health effects; these MCLs are a set of enforceable standards for drinking water quality.

National Priorities List (*NPL*) - the United States Environmental Protection Agency's list of the most serious, uncontrolled or abandoned hazardous waste sites identified for possible long-term remedial action.

National Oil and Hazardous Substances Contingency Plan *(NCP)* – the federal regulation that guides determination of the sites to be corrected under both the Superfund program and the program to prevent or control spills into surface waters or elsewhere.

Plume – a visible or measurable discharge of a contaminant from a given point of origin.

Proposed Plan - a public participation requirement of CERCLA in which Illinois EPA summarizes for the public the preferred cleanup strategy, rationale for the preference, and alternatives presented in the detailed analysis of their remedial investigation. This document must actively solicit public review and comment on all alternatives under consideration.

PRP (*Potentially Responsible Party*) - any individual(s) or company(s) potentially responsible for, or contributing to, the contamination problems at a hazardous waste site. PRPs can include present and former site owners and operators, as well as anyone who generated or transported the hazardous wastes found at the site. Whenever possible, through administrative and legal actions, Illinois EPA/USEPA requires PRPs to clean up sites they have contaminated.

Record of Decision (ROD) - a public document that explains which cleanup alternatives will be used. The ROD is based on information and technical analysis generated during the remedial investigation and consideration of public comments and community concerns.

Remedial Investigation/Feasibility Study *(RI/FS)* - investigative and analytical studies usually performed at the same time in an interactive, iterative process, and together referred to as the RI/FS. They are intended to: gather the data necessary to determine the type and extent of contamination at a Superfund site; establish criteria for cleaning up the site; identify and screen cleanup alternatives for remedial action; and analyze in detail the technology and costs of the alternatives.

Responsiveness Summary - a summary of oral and written public comments received by Illinois EPA during the comment period on key documents and the Illinois EPA's responses to those comments. The Responsiveness Summary is a key part of the ROD, highlighting community concerns for decision-makers.

Solvent - a liquid substance capable of dissolving or dispersing other substance (liquids or solids)

Tetrachloroethene *(PCE)* – a volatile organic compound (VOC)

1,1,1-Trichloroethane *(TCA)* – a volatile organic compound (VOC)

Trichloroethene *(TCE)* - a stable, low boiling-point colorless liquid; used as a solvent or metal degreasing agent, and in other industrial applications.

Vadose zone - the zone between land surface and the water table where the moisture content is less than saturation and pressure is less than atmospheric. Soil pore space also typically contains air or other gases.

Volatile - readily vaporizable at relatively low temperature.

Volatile Organic Compound *(VOC)* - any organic compounds that have a high vapor pressure and low water solubility. Many VOCs are human-made chemicals that are used and produced in the manufacture of paints, pharmaceuticals, and refrigerants. VOCs typically are industrial solvents (such as trichloroethylene); fuel oxygenates (such as methyl tert-butyl ether (MTBE)); or by-products produced by chlorination in water treatment (such as chloroform). VOCs are often components of petroleum fuels, hydraulic fluids, paint thinners, and dry cleaning agents.

Beloit Corporation Administrative Record
September 2004

The Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA), requires the establishment of an Administrative Record upon which the Agency bases its final remedy to treat contaminated soil and groundwater on-site and address ground water off-site at the Beloit Corporation Superfund site located in Rockton, Illinois.

The Illinois Environmental Protection Agency (Illinois EPA) has compiled and updated the following official Administrative Index for the Beloit Corporation site located in Winnebago County, Illinois.

Please contact Michelle Tebrugge, Illinois EPA Community Relations Specialist, Office of Community Relations, 1021 North Grand Avenue East, P.O. Box 19276, Springfield, Illinois 62794-9276 (217/524-4825) for more information on who and where to direct questions concerning this index.

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	Correspondence to Paul E. Takacs (Illinois EPA)	6/26/90	Jennifer T. Nijman (Coffield Ungaretti Harris & Slavin)	1
	Correspondence to Paul E. Takacs (Illinois EPA)	7/11/90	Andrew H. Perellis (Coffield Ungaretti Harris & Slavin)	3
	Memo to Bureau of Land's Division File from Paul E. Takacs	7/27/90	Paul E. Takacs (Illinois EPA)	1
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	Consent Decree	10/17/91	Illinois Attorney General's Office	107
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	Community Relations Plan	9/11/92	Illinois EPA	19
	Correspondence to Eric Runkel (Illinois EPA)	9/24/92	Cara McGuirk (Ebasco)	3

	Correspondence to Eric Runkel (Illinois EPA)	10/02/92	Kenneth G. McCann (Illinois Department of Public Health)	2
	Correspondence to Jennifer T. Nijman (Coffield Ungaretti Harris & Slavin)	10/05/92	Paul R. Jagiello (Illinois EPA)	2
	National Exposure Registry Trichloroethylene (TCE) Subregistry Baseline Technical Report	5/93	Agency for Toxic Substances and Disease Registry	242
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	Correspondence to Jennifer T. Nijman (Coffield Ungaretti Harris & Slavin)	11/24/93	Susan W. Horn (Illinois Attorney General's Office)	2
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	35 IAC 620 – Final	8/11/94	Illinois Pollution Control Board	109
	Fact Sheet #2	9/94	Illinois EPA	2
	National Exposure Registry Trichloroethylene (TCE) Subregistry Baseline Technical Report (Revised)	12/94	Agency for Toxic Substances and Disease Registry	230
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	Removal Action Design Report (Addendum)	10/17/95	Montgomery Watson	24
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	Correspondence to Eric Runkel (Illinois EPA)	12/13/95	Perry V. Salvadorini (Larson's Culligan of Rockford)	1

	Letter of Agreement with Larson's Culligan of Rockford	1/96	Illinois EPA	2
	National Exposure Registry Trichloroethylene (TCE) Subregistry Followup 1 Technical Report	3/96	Agency for Toxic Substances and Disease Registry	104
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	Correspondence to Eric Runkel (Illinois EPA)	4/02/01	William Sass (ecology & environment, inc.)	8
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	Memo to Terese Von Donsel (USEPA)	7/18/02	Larry Jensen, CHP (USEPA)	1

Beloit Corporation Administrative Record
September 2004

The Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA), requires the establishment of an Administrative Record upon which the Agency bases its final remedy to treat contaminated soil and groundwater on-site and address ground water off-site at the Beloit Corporation Superfund site located in Rockton, Illinois.

The Illinois Environmental Protection Agency (Illinois EPA) has compiled and updated the following official Administrative Index for the Beloit Corporation site located in Winnebago County, Illinois.

Please contact Michelle Tebrugge, Illinois EPA Community Relations Specialist, Office of Community Relations, 1021 North Grand Avenue East, P.O. Box 19276, Springfield, Illinois 62794-9276 (217/524-4825) for more information on who and where to direct questions concerning this index.

No.	Document Title	Date	Author	No. of Pages
	Correspondence re: alleged violations	5/08/80	Robert A. Wengrow (Illinois EPA)	2
	Memo to Bureau of Land's Division File	5/23/83	Kenneth Bardo (Illinois EPA)	2
	Correspondence re: latest test data for water treatment equipment	5/27/83	James McGuire (Beloit Corporation)	9
	Receipt of Agency documents (Citizen Complaint)	4/23/84	Illinois EPA	4
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	Illinois EPA Observation Report	10/02/85	Illinois EPA	3
	Correspondence re: investigation of an alleged violation	10/08/85	Robert A. Wengrow (Illinois EPA)	2
	Uniform hazardous waste manifest	10/08/85	David Haase (Beloit Corporation)	8
	Compliance inquiry	10/21/85	Douglas McLeish (Beloit Corporation)	1
	Correspondence re: disposal of laboratory materials	11/04/85	Adriane Shuart (Chemical Waste Mgmt, Inc.)	3
	Waste stream characterization report	3/07/86	Mark Wildhagen (Aqua-Tech, Inc.)	4
	Compliance Inquiry Letter	4/03/86	Robert A. Wengrow (Illinois EPA)	1

	Correspondence re: hazardous waste manifest (3/07/86)	4/11/86	Douglas McLeish (Beloit Corporation)	1
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	Generator Annual Hazardous Waste Report	5/13/86	Douglas McLeish (Beloit Corporation)	2
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	Correspondence to Paul E. Takacs (Illinois EPA)	9/11/89	Andrew H. Perellis (Coffield Ungaretti Harris & Slavin)	1
	Correspondence to Paul E. Takacs (Illinois EPA)	10/02/89	Andrew H. Perellis (Coffield Ungaretti Harris & Slavin)	1
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