

5800 East Jewell Avenue

Chronology

September 2006

1956-1957	Hamilton Watch Company's subsidiary, Hathaway Instruments, Inc., purchased the property, designed and built the facility on the site. Hathaway moved into the facility in early 1957.
1957-1998	Various manufacturing operations were conducted at the site by entities that made electronic equipment, computer parts, rifle and spotting scopes, binoculars and other machined products.
1965	Hathaway sold the site to Gulf Southwest Capital Corporation; IBM leased the building for 1-1/2 years.
1967	Redfield Gun Sight Company purchased the site and moved its rifle scopes manufacturing operations to the facility.
1967-1998	Redfield brand rifle and spotting scopes, binoculars and related products were manufactured at the site. The ownership of the Redfield business changed several times in this period. In 1971, Outdoor Sports Industries, Inc. purchased the site and the business. A company that eventually became Brown Group Retail, Inc. purchased the site and business in 1979 and sold the business and operations to Redfield Rifle Scopes, Inc. (RRSI) in 1984, while retaining ownership of the property and building.
1993	RRSI discontinued use of its chlorinated solvent vapor degreaser, and the equipment was removed from the building and sold. Brown Retail began to conduct environmental site investigations at the property in anticipation of selling the site, and completed an initial study in December 1993. Brown Retail continued with those investigations up to the time that the Colorado Department of Public Health and the Environment (CDPHE) took an oversight role in 1997.
1994	A prospective purchaser conducted an independent investigation, including taking some groundwater samples. Those samples revealed the presence of cleaning solvents in groundwater beneath the site. CDPHE was immediately notified after tests showed the presence of solvents in groundwater under the site. Brown Retail completed an additional environmental assessment at the site including installing seven temporary and three permanent groundwater monitoring wells on the property.
1995	After discovering petroleum constituents in the groundwater beneath the site, CDPHE was notified a second time and told that these constituents apparently were coming from upgradient sources. With approval from CDPHE, Brown Retail installed a soil-vapor extraction device in the area where degreasing operations were formerly conducted in order to remove or reduce the volume of contaminants under the building. Pilot tests demonstrated that the device was effective. Brown Retail installed additional groundwater monitoring wells on the property.

1995	A groundwater well survey of the area surrounding the site revealed that city water was used exclusively in the area; drinking water would not be a pathway for exposure to cleaning solvents in the groundwater.
	Groundwater test results at the site showed declining concentrations of cleaning solvents.
1996	Additional groundwater test results continued to show declining concentrations of cleaning solvents.
1997	Sampling of groundwater at the site continued. Groundwater testing showed high concentrations of pollutants entering the site from upgradient facilities.
	Brown Retail's discussions with CDPHE centered at this time on the emerging science surrounding the recently discovered phenomenon of vapors from groundwater contamination moving into basements or the lower level of homes.
	Brown Retail installed nine additional permanent groundwater monitoring wells at the site.
1997-1998	Brown Retail tested different remediation technologies for addressing the solvents in the groundwater beneath the building.
1998	CDPHE issued Compliance Order No. 98-05-19-02 to Brown Retail and RRSI requiring environmental investigation and cleanup work to be conducted.
	Brown Retail installed groundwater monitoring wells in the street around the northeast boundary of the property. Cleaning solvents and petroleum-based contaminants were found in the groundwater.
	Indoor air samples collected from homes near the northeast boundary of the site revealed the presence of 1,1-dichloroethene (1,1-DCE).
	Brown Retail installed indoor air ventilation systems in homes with monitored levels of 1,1-DCE greater than 0.49 micrograms per cubic meter of air (0.49 $\mu\text{g}/\text{m}^3$), the action level established by CDPHE at that time.
	Brown Retail held four public meetings with Cook Park and Virginia Village residents to discuss the contamination and plans to address it. Brown Retail also conducted one-on-one meetings with 21 residents in Cook Park to develop a community relations plan, set up the information hotline that has operated continuously ever since and is updated monthly, set up a contact telephone number to respond to residents' phone calls, and began to provide information about the site and the environmental investigation activities via article submissions to the Cook Park Neighborhood Association newsletter.
	Brown Retail installed 23 groundwater monitoring wells in the areas near the site where the groundwater was thought to flow.
	RRSI, the tenant and operator of the manufacturing facility at the site, went out of business.
	CDPHE approved Brown Retail's ongoing monitoring plan, designed to closely monitor the area to detect any changes in the status of the site, and indoor air or groundwater in the surrounding residential areas.
	By year-end, Brown Retail had tested the indoor air in 166 homes and installed 56 ventilation systems.
1999	CDPHE entered into a Compliance Order on Consent with Brown Retail that superseded the 1998 Compliance Order.
	Public meetings were held in June and September. No new or additional homes were tested, but six homes within the original test area that previously had tested below the action level, now had 1,1-DCE levels above the State's action level. Brown Retail installed ventilation systems in those six homes.

1999	CDPHE approved Brown Retail's plan for a groundwater "pump-and-treat" system. The system captures groundwater at the downgradient perimeter of the site, removing contaminants from the groundwater before it leaves the site and reinjecting clean water. The system prevents contaminated groundwater from leaving the site and, by reinjecting the treated clean water, flushes contaminated groundwater downgradient from the Redfield site.
2000	<p>During routine indoor air monitoring, a house located in the 1700 block of S. Ivy Street that had previously tested below the action level for 1,1-DCE, now tested above the action level, prompting further indoor air and groundwater testing to the north. The additional testing identified homes with 1,1-DCE in indoor air above the action level between E. Mexico Avenue and E. Iowa Avenue. This further testing also revealed a narrow bedrock channel that enables groundwater to move to the north and northwest.</p> <p>Brown Retail conducted additional investigations on the site to further identify and characterize potential on-site and upgradient sources of groundwater contamination.</p>
March 2000	The groundwater treatment system began operating; by June, the system had successfully treated 1.7 million gallons of water. This system continues to operate through the present.
Spring/ Summer 2000	Brown Retail held a public meeting to discuss a potential tenant to lease the building. CAPCO Tile and Stone moved its showroom and warehouse into the Redfield building, and continues to lease it through the present.
2000	Brown Retail voluntarily installed a groundwater monitoring well on the former Ash Grove School property and conducted indoor air testing inside the school, which showed that no 1,1-DCE was present.
July 2000	A public meeting was held concerning the status of residential indoor air tests, updates on the groundwater treatment system and real estate updates.
Fall/Winter 2000	Brown Retail installed several new monitoring wells to track the direction of groundwater flow and conducted indoor air testing in an expanded area north of E. Mexico Avenue. As of mid-November, Brown Retail had sampled the indoor air in 81 homes and installed ventilation systems in 51 homes north of E. Mexico Avenue.
2000	Preliminary test results on groundwater sampled near Cherry Creek between S. Holly and Monaco Streets indicated that groundwater with elevated concentrations of 1,1-DCE might extend to Cherry Creek. Brown Retail continued to test the indoor air of homes directly above groundwater containing elevated levels of 1,1-DCE, and testing adjacent homes until a zone of homes without impacted indoor air were identified.
Fall/Winter 2000	Public meetings were held in October and December 2000. Topics presented at the meetings included the status of residential indoor air tests, health information, real estate updates and updates on the groundwater treatment system.
2000	Brown Retail created a Web site, www.redfieldsite.org , to provide the community with historical and current information about the site, and to update the community on the indoor air and groundwater investigation, as well as the environmental mitigation activities being conducted.
Winter 2001	Brown Retail expanded indoor air testing in a northwestern direction, and into the Virginia Village and Ellis neighborhoods. Public meetings were held in February 2001 to explain testing and procedures to residents living in those neighborhoods.

2001	Select units of Cherry Creek Village Condominiums were tested. A public meeting was held in June for residents of Cherry Creek Village Condominiums.
	Brown Retail conducted a groundwater investigation north of Cherry Creek, and submitted a report to CDPHE in September indicating that surface water and groundwater in and north of Cherry Creek have not been impacted by the Redfield groundwater plume.
November 2001	Groundwater monitoring wells were installed at 17 additional locations in mid-November as part of the off-site groundwater investigation.
January 2002	Brown Retail published and distributed the first edition of its community newsletter, Update, to inform area residents about the environmental investigation and cleanup work being performed relating to the Redfield site.
2002	The geographic extent of groundwater contamination downgradient of the Redfield site was defined.
March 2002	Brown Retail completed its Off-Site Groundwater Characterization Report, which was approved by CDPHE in late May 2002.
Summer 2002	The Colorado Department of Transportation (CDOT) constructed a groundwater remediation system designed to treat contaminants that have migrated under the Redfield site from a former dry-well facility located on CDOT's Region 6 Headquarters property adjacent to the Redfield site.
August 2002	Brown Retail distributed a new edition of its community Update newsletter describing recent environmental investigation and remediation activities.
August 2002	EPA revised its guideline on acceptable levels of 1,1-DCE in indoor air finding: (a) insufficient evidence to derive a cancer risk factor, and (b) raising the non-cancer risk factor to 200 micrograms per cubic meter of air ($\mu\text{g}/\text{m}^3$), which is more than 400 times higher than CDPHE's action level of $0.49 \mu\text{g}/\text{m}^3$ at that time. None of the homes near the Redfield site has ever tested above the new EPA guideline.
October 2002	Brown Retail submitted its Off-Site Corrective Measures Work Plan to CDPHE on October 1, detailing its plans for further remediation of off-site groundwater, including plans to enhance the pump-and-treat system and constructing a bioremediation system to accelerate the breakdown of solvents. CDPHE approved the Work Plan in January 2003.
	By October 1, the pump-and-treat groundwater-containment system had treated more than 12.1 million gallons of water.
	A public meeting was held on October 29 to discuss Brown Retail's off-site cleanup plan, off-site monitoring and EPA's new guideline for 1,1-DCE.
Spring/Summer 2003	Brown Retail designed off-site corrective measures and installed additional extraction and injection wells to enhance the existing groundwater pump-and-treat containment system.
Summer 2003	A community Update newsletter was published discussing additional soil testing that had been conducted at the Redfield site.
June 2003	Brown Retail submitted its On-Site Corrective Measures Work Plan to CDPHE.
September 2003	Brown Retail held a public meeting on September 23 to discuss its proposed on-site corrective measures.
October 2003	By October 1, approximately 16.1 million gallons of groundwater had been treated by the groundwater containment system.

December 2003	CDPHE approved Phase I of the On-Site Corrective Measures Work Plan, authorizing Brown Retail to evaluate methods to remove or minimize on-site sources of solvents.
March 2004	Brown Retail began installing wells for the groundwater bioremediation system. The system is designed to break down solvents in the groundwater more quickly than natural attenuation by increasing the amount of native biological organisms in the groundwater that break down solvents.
April 2004	Sampled groundwater monitoring wells on S. Jasmine Street to establish a baseline for future bioremediation system sampling.
May 2004	A community Update newsletter was published to provide information to residents concerning off-site groundwater cleanup and the bioremediation system.
Summer 2004	CDPHE approved a pilot test of a Multi-Phase Extraction system to evaluate its effectiveness in removing contaminants on-site pursuant to the On-Site Corrective Measures Work Plan.
August 2004	As of August 1, Brown Retail had tested 724 homes in the total test area. Of those, 395 homes tested above the state's action level of 0.49 µg/m ³ for 1,1-DCE. All homes that tested above the action level were offered a ventilation system; 381 homes accepted and have had a ventilation system installed.
	Brown Retail held a public meeting on August 9 for S. Jasmine Street residents to provide information and field questions about the installation of the bioremediation system.
	CDPHE published a new interim policy that revised interim screening and remediation levels for trichloroethene (TCE) in indoor air, making them more stringent. The new policy states that for indoor air concentrations of TCE ranging from 0.8 to 1.6 µg/m ³ , CDPHE will require further study to determine the sources of contamination and whether remediation will be required. For TCE concentrations in excess of 1.6 µg/m ³ , CDPHE may require remediation, depending upon whether the source of TCE in indoor air is groundwater or an unrelated indoor source.
September 2004	Brown Retail conducted tracer tests of the bioremediation system along the 1700 block of S. Jasmine Street.
October 2004	Construction and sampling activities related to the bioremediation system wells along the 1700 and 1800 blocks of S. Jasmine Street were initiated.
November 2004	By November 1, approximately 21.7 million gallons of groundwater had been treated by the groundwater containment system.
Late 2004	CDPHE increased its statewide action level for 1,1-DCE in indoor air from 0.49 µg/m ³ to 5 µg/m ³ .
December 2004	Brown Retail published a community Update newsletter to inform residents of anticipated changes to the indoor air monitoring and cleanup programs associated with the Redfield site.
January 2005	Brown Retail submitted the Implementation of New 1,1-DCE Indoor Air Action Level, Former Redfield Facility Work Plan to CDPHE proposing modifications to the indoor air monitoring and mitigation program resulting from the change in the 1,1-DCE action level. CDPHE approved the Work Plan in February 2005.

January 2005	Brown Retail created two new fact sheets discussing the changes to the indoor air action levels for 1,1-DCE (Update on Testing and Indoor Air Ventilation for 1,1-Dichloroethene (1,1-DCE)) and TCE (Update on Trichloroethene) and describing the effect of these changes on the Redfield site indoor air monitoring and mitigation program. Existing "Q&A" fact sheets concerning the off-site groundwater cleanup program and health questions were revised and republished.
	A public meeting was held on January 26 to provide information to residents about recent developments in the indoor air monitoring and cleanup program.
	The groundwater bioremediation system began operating.
April 2005	Brown Retail began to implement Phase I of the revised indoor air monitoring and mitigation plan. Phase I addresses homes that originally tested (i.e., prior to mitigation) between 0.49 µg/m ³ and 2.5 µg/m ³ for 1,1-DCE and below 0.8 µg/m ³ for TCE. Letters were sent to residents of these homes informing them that indoor air remediation and/or monitoring may no longer be necessary for their home.
June 2005	As of June 1, approximately 24.5 million gallons of groundwater had been treated by the groundwater containment system.
Summer/Fall 2005	The second phase of the Multi-Phase Extraction (MPE) system pilot test began. This pilot test assessed the feasibility of using the MPE system to remove contaminants from on-site soils.
September 2005	A new edition of the community Update newsletter was published to further inform residents about the changes to the indoor air monitoring program based upon new 1,1-DCE and TCE action levels and the status of those changes.
Fall/Winter 2005	Phase II of the modified indoor air monitoring and mitigation program will be implemented. Phase II will focus on homes that originally tested between 2.5 and 5.0 µg/m ³ for 1,1-DCE and below 0.8 µg/m ³ for TCE. Phase III will follow in 2007, addressing homes that originally had 1,1-DCE and/or TCE concentrations in excess of CDPHE's new action levels. Although these homes initially tested in excess of CDPHE's revised standards, indoor air concentrations of 1,1-DCE and TCE should decrease as the underlying groundwater is cleaned up.
July 2006	Derek Boer replaces Marion Galant as the CDPHE Community Involvement Specialist for the Redfield site.
August 2006	CDPHE approved the summary report <i>Phase I Results – Implementation of New 1,1-DCE Indoor Air Action Level Work Plan, Former Redfield Facility</i> , summarizing Brown Retail's evaluation of the status of Phase I homes. Of the 88 homes re-evaluated in Phase I, 86 met the state's new action levels and therefore, do not require continued operation of the ventilation systems. Homeowners who meet the state's new action levels are sent a letter notifying them that they no longer need to operate their indoor air remediation system for compounds associated with the Redfield site.
September 2006	44 homes re-tested as part of Phase II evaluations. A second round of winter testing will be conducted. Once testing is complete, homes with two consecutive tests below the new action levels will also be notified that they no longer need to operate their system for Redfield related compounds.
	As of September 1, approximately 30.9 million gallons of groundwater had been treated by the groundwater containment system.