

DOCUMENTATION OF ENVIRONMENTAL INDICATOR DETERMINATION

Interim Final 2/5/99
Revised 9/20/02

RCRA Corrective Action
Environmental Indicator (EI) RCRA Info code (CA750)
Migration of Contaminated Groundwater Under Control

Facility Name: SECO Products
Facility Address: Old Highway 100 East, Washington, Missouri 63090
Facility EPA ID #: MOD068549492

DETERMINATION RESULT: YE

1. Has **all** available relevant/significant information on known and reasonably suspected releases to the groundwater media, subject to RCRA Corrective Action (e.g., from Solid Waste Management Units (SWMU), Regulated Units (RU), and Areas of Concern (AOC)), been **considered** in this EI determination?

 X If yes - check here and continue with #2 below.

 If no - re-evaluate existing data, or

 if data are not available, skip to #8 and enter "IN" (more information needed) status code.

The Southern Equipment Company (SECO) Products facility originated in 1952 as the Washington Metal Products Company and was subsequently purchased by the McGraw-Edison company. The name was changed to SECO Products. McGraw-Edison sold the company to International Foodservice Equipment Systems (IFES) in 1980. IFES later changed its name to BIH Foodservices Inc. (Jacobs Engineering Group Inc. [Jacobs Engineering] 1988). The Hussmann Foodservice Corporation acquired the company in 1985 (Shannon and Wilson, Inc. [Shannon and Wilson] 1995) and subsequently sold SECO Products in 1989 to Middleby Marshall Inc., a subsidiary of the Middleby Corporation. SECO Products went bankrupt and the facility ceased operations in October 1999 (Tetra Tech EM, Inc. [Tetra Tech] 2002). The facility is currently owned by Mr. Steve Murphy (through an LLC), and he is leasing part of the building for use as warehouse space (Tetra Tech 2005).

SECO Products is located at Old Highway 100 East, Washington, Missouri (see Figure 1 in Appendix A). SECO Products manufactured equipment for food storage, preparation, and displays. Plant operations involved metal fabrication. The plant has about 165,000 square feet under roof, with employee parking on the east side of the plant, and shipping and receiving facilities on the west side (Shannon and Wilson 1995). A fenced area surrounds a former lagoon on the north side of the plant, which was removed from service in 1982 and formally closed in 1987 (Shannon and Wilson 1995). The facility septic system drain field also is located north of the plant. The Union Pacific Railroad right-of-way borders the site on the north, a steeply sloping hillside borders the east side, and Dubois Creek borders the south and west sides. Dubois Creek enters the Missouri River about 4,500 feet northeast of the site. Activities at the facility ceased in October 1999.

Solid waste management units (SWMU) and areas of concern (AOC) identified at SECO Products to date are described below (Jacobs Engineering 1988). Figure 1 of Appendix A shows the location of the facility, and Figure 2 of Appendix A outlines the locations of the SWMUs and AOCs.

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SWMUs and AOCs

SWMU 1, Lagoon: For much of its operating history, SECO Products made use of a surface impoundment constructed in 1976 to dispose of wastewater from its metal polishing/metal-etching operations. The surface impoundment was bentonite-lined and had a capacity of 561,000 gallons; the dimensions were 75 feet by 100 feet and 10 feet deep. The reported berm thickness was 8 feet at the top and 30 feet at the base, and the outside slope was vegetated and had a 3 to 1 slope. Acids used in the metal polishing process, and metals were components of the waste stream. SECO Products representatives reported that 20 to 30 gallons of trichloroethene (TCE) were inadvertently discharged to the surface impoundment (Clemons 1987). The wastewater was piped directly to the lagoon from the facility. The surface impoundment was taken out of active service in 1983 when the facility discontinued these processes. From 1983 to 1984, only boiler blowdown water was discharged to the surface impoundment at an average rate of 5 gallons per month (Clemons 1987). In June 1987, SECO Products reportedly neutralized the rainwater and boiler blowdown water collected in the surface impoundment and discharged the treated water into Dubois Creek under authority granted by Missouri Department of Natural Resources (MDNR) in a temporary National Pollutant Discharge Elimination System (NPDES) permit. The impoundment was closed in the early 1990s (Shannon and Wilson 1995). Historically, sludge and soil samples from SWMU 1 revealed total chromium, nickel, copper, and TCE concentrations above background. Groundwater samples revealed TCE and degradation products 1,2-dichloroethene (DCE) and vinyl chloride (VC) above U.S. Environmental Protection Agency (EPA) maximum contaminant levels (MCL) (Jacobs Engineering 1988).

SWMU 2, Exterior Drum Storage Pad: The exterior drum storage pad is a 2,250-square-foot (45 feet by 50 feet) reinforced concrete slab that is 6 inches thick. No curbs or other spill containment features surround the slab. The storage area was in operation until 1985, when a closure plan for closure as a hazardous waste storage unit was submitted. After closure, SECO Products intended to reactivate the storage pad as a less-than-90-day accumulation facility. Drummed waste solvents (F001 and D001 wastes) and waste oil were the primary wastes stored in the unit. Spills have occurred around the storage pad (Clemons 1987). Volatile organic compounds (VOC)—including TCE, toluene, and methylene chloride—historically have been detected in soil and groundwater in the vicinity of SWMU 2 (Jacobs Engineering 1988).

SWMU 3, Interior Drum Storage Pad: The interior drum storage pad is located inside the plant near a vapor degreaser in the manufacturing area. An area had been designated and painted on the facility's concrete floor for drummed waste storage. No external containment surrounds the pad other than that provided by the building walls. No floor drains were noted in the vicinity. The drums were stored on pallets and contained liquids and sludges. Waste stored at this SWMU included waste TCE liquids and waste TCE solids (F001), and mixed solvent waste comprised of hexane, toluene, and methylene chloride (Clemons 1987). No releases have been documented from this SWMU (Jacobs Engineering 1988).

SWMU 4, Southern Fenceline: The southern fenceline was not an engineered disposal unit but became a SWMU because of past practices of routine and systematic discharges. From 1952 to 1973, TCE was reportedly poured along the entire southern fenceline (approximately 1,300 feet) for weed control purposes (Clemons 1987). The amount of TCE disposed of during the 22-year span is unknown; however, as much as 130,000 gallons of TCE could have been disposed of in this manner (MDNR 1987). Historically, TCE and its degradation products have been documented in soil and groundwater beneath SWMU 2. A sediment sample from the drainage ditch along Old Highway 100 revealed no detectable VOCs (Jacobs Engineering 1988).

SWMU 5, Historic Acid/Metals Deposition Field: The historic acid/metals deposition field is not an engineered disposal unit, but is a SWMU because of past practices of routine and systematic discharges. From 1952 to 1960, waste stream effluent from the electropolishing and metal-etching processes was dumped into this area. The area lies between the drainage ditches of outfalls #001 and #002, and covers approximately 30,000 square feet. A 1987 trip report for EPA noted that the area was noticeably bare of vegetative cover and the soils had a distinct green tint (Clemons 1987). Historically, phosphates, fluorides, nitrates, and chlorides resulting from the acid portion of the

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discharge have been detected in groundwater downgradient of SWMU 5. TCE has also been detected in groundwater in the vicinity of SWMU 5; however, the source of this TCE is likely another SECO Products SWMU. Soil samples collected from the historic acid/metals deposition field revealed concentrations of aluminum, barium, chromium, copper, iron, nickel, and TCE above background (Jacobs Engineering 1988).

SWMU 6, Aboveground Tank Pad Area: The aboveground tank pad area is located adjacent to the outside of the building on the north side between the building wall and the pumphouse and the production well. TCE and fuel oil storage tanks were located on a gravel pad area. No concrete pad or secondary containment were observed during the RCRA Facility Assessment (RFA). The TCE tank was reported by SECO Products representatives to have been removed from service in 1986. The fuel oil tank is still present. The tanks had a reported capacity of 2,000 to 3,000 gallons (Clemons 1987). Evidence of spills and vegetative stress have been reported and likely were caused by unloading the tanks by hand. Historically, TCE and other solvents—including methylene chloride, toluene, and *trans*-1,2-DCE—have been detected in the soil and groundwater beneath SWMU 6 (Jacobs Engineering 1988).

SWMU 7, Metal Particulate Burial Area: The metal particulate burial area (a former trench) is not an engineered disposal unit, but is deemed a SWMU because of deliberate past management practices. SECO Products personnel stated that the ditch was backfilled with the filters from the metal particulate exhaust system when a buried roof drainage conduit was unearthed for replacement or repair. The exhaust system collected particulates from deburring and grinding operations. The trench extended from the corner on the north wall of the building to the southwest corner of the surface impoundment (Clemons 1987). The trench was about 40 to 50 feet long and of unknown depth. Soils at SWMU 7 are contaminated with stainless steel metal particles. Historically, soil samples collected at SWMU 7 have shown iron, nickel, chromium, and other total metals concentrations above background. A release of these contaminants to groundwater is not expected (Jacobs Engineering 1988).

SWMU 8, Field Northeast of Impoundment: The field northeast of the surface impoundment is not an engineered waste disposal unit, but is deemed a SWMU because of past management practices. The subsurface soil and alluvial aquifer east of the surface impoundment are known to be contaminated with TCE. During a boring survey for soil vapor, SECO Products consultants identified a contaminated area segregated from the other positive organic vapor readings (Reed and Associates, Inc. 1989). During the 1988 RFA, SECO Products personnel stated that a TCE storage tank may have been located in the same area. Although the tank's exact location, dates of operation, and size are unknown, it was reportedly large. Leaking from such a storage tank could be responsible for the contamination in the isolated area (Clemons 1987). Historically, TCE has been documented in soil and groundwater beneath SWMU 8 (Jacobs Engineering 1988).

SWMU 9, Potential Acid/Metals Waste Pile Area – West: Two areas of discolored material, 10 to 12 feet in diameter, are located about 100 feet west of the northwest corner of the plant building. No vegetation is growing in the discolored material, which appears to be similar to that found in SWMU 5. The material appears to be highly reduced and has a greenish tint (Clemons 1987). Historically, soil samples collected at SWMU 9 have shown total metals of concentrations above background. A release of these contaminants to groundwater is not expected (Jacobs Engineering 1988).

SWMU 10, Abandoned Drums: Several abandoned 55-gallon drums and 5-gallon cans were observed during the 1988 RFA. The drums and cans observed had no legible markings to indicate contents, owner, or manufacturer. The drums were located in the wooded area along the east bank of Dubois Creek on the SECO Products property. At least four drums and one 5-gallon can were discarded on the property. Some drums were half-buried, while others appeared to be empty. Drum integrity appeared to be minimal, and SECO Products personnel were unsure of their origin or possible contents. Possibly, the drums had been empty and deposited on the property during past flooding (Clemons 1987). This theory was further substantiated during a site visit when empty drums were noted on both sides of Dubois Creek, and similar empty drums were found stored at the wastewater treatment plant across and downstream from the SECO Products facility. No releases have been documented from this SWMU (Jacobs Engineering 1988).

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SWMU 11, Former Metal Polishing Acid Room: This room, located along the north wall of the plant building, housed the electropolishing/metal-etching processes. Floor drains in this room lead directly to the surface impoundment. The acid/metals wastes from these operations were piped directly to the surface impoundment. When the vacuum-type annealing oven was brought on line in 1983, the electropolishing and metal-etching processes were discontinued and the bath tanks were removed. The drains were capped at the building exterior. The room then was used as a drummed product storage area. Because of past manufacturing practices, the room was splashed with the acid/metals solutions as evidenced by the degradation, discoloration, and etching of the concrete floors and walls in the room (Clemons 1987). No releases to soil or groundwater are expected from the containment of the former metal polishing acid room itself. Releases related to the designed discharge from the former electropolishing/metal-etching area are discussed under SWMUs 1 and 5 (Jacobs Engineering 1988).

AOC 1, Drainage Ditch to Outfall #001: A historic release of the acid/metals waste stream from the electropolishing and metal-etching processes from 1960 to 1976 through this drainage ditch could have contaminated the ditch sediments. Surface water carrying contaminants from the northern portion of the site also would have passed through this ditch enroute to Dubois Creek. Contaminants released into this ditch when otherwise dry could have migrated through the sediments to the alluvial aquifer. Boiler blowdown water and spent cooling water have also been historically discharged through this drainage ditch. Blowdown water contained compounds to inhibit lime buildup and algae growth. Because of the widespread TCE contamination known at the facility, TCE-laden contaminants possibly have passed through this ditch. Historically, soil samples collected at AOC 1 revealed concentrations of chromium, copper, iron, and zinc above background. A release of these contaminants to deep groundwater is not expected (Jacobs Engineering 1988).

AOC 2, Drainage Ditch to Outfall #002: The drainage ditch to outfall #002 was designed to carry septic tank and filtered and treated sanitary wastewater from the SECO Products facility. However, runoff and erosion from SWMUs 5 and 9 could have also contaminated the drainage ditch. TCE and other solvents also may have been dumped into the facility's sanitary waste system. Liquid organic contaminants released to this ditch may have migrated through the soil into the alluvial aquifer (Clemons 1987). Historically, soil samples collected from AOC 2 have shown no significant concentrations of total metals or VOCs. A release of contamination to deep groundwater is not expected for AOC 2 (Jacobs Engineering 1988).

AOC 3, Effluent from Outfall #001: The effluent from outfall #001 was regulated through NPDES permit # MO-0002577, which required sampling for temperature and pH. Based on the past history of this facility, organic, inorganic, and metal constituents could have been released from this outfall. A one time discharge permit for effluent from outfall #003 (lagoon effluent) was granted to release pH-adjusted rainwater collected in the lagoon to aid in the closure of the lagoon. Outfall #003 was actually discharged through outfall #001. Samples from the alluvial fan at Outfall #001 revealed concentrations of aluminum, barium, cadmium, iron, manganese, and vanadium above background (Jacobs Engineering 1988).

AOC 4, Effluent from Outfall #002: The effluent from outfall #002 was regulated through NPDES permit # MO-0002577. In light of the facility's past history and known environmental problems, the effluent was monitored and restricted for organic, inorganic, and metal parameters (Clemons 1987). Samples from the alluvial fan at Outfall #002 revealed concentrations of aluminum, barium, chromium, copper, manganese, and mercury above background. A grab sample of the effluent from Outfall #002 revealed detectable concentrations of aluminum, copper, iron, manganese, and 1,2-DCE (Jacobs Engineering 1988).

AOC 5, Decommissioned Buried Tanks: Two underground storage tanks, which at one time reportedly contained #5 diesel fuel, were, according to SECO Products personnel, removed from service around 1971. The age and capacity of these tanks is unknown. These tanks were reportedly filled with sand and left in place; however, SECO Products could not provide any documentation to support this supposition. Because of the removal of the filler stems, the exact location of these tanks is uncertain. The tanks are believed to have been situated somewhere

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between the pumphouse and the plant building's north wall. Leaks from these tanks could release organic contaminants to the alluvial aquifer and subsurface soil gas (Clemons 1987). No releases have been documented from this AOC (Jacobs Engineering 1988).

AOC 6, On-site Production Well: The RFA identified the on-site production well as an AOC. The SECO Products facility production well provided all water used by the facility (Clemons 1987). The well is completed in the bedrock aquifer. On previous occasions, the production well water showed low levels of TCE. In subsequent sampling activities, the well water did not show any levels of TCE. Organic contamination levels in the well should be closely monitored both as protection for employee exposures and as an indication of bedrock aquifer contamination. Potentially, well drawdown could have induced a cone of depression that drew contaminants from overlying aquifers into the well. The plant production well is 860 feet deep and cased to a depth of 445 feet. The bedrock aquifer supplying the well is artesian. No soil sampling has been reported for AOC 6 (Jacobs Engineering 1988).

BACKGROUND

Definition of Environmental Indicators (for the RCRA Corrective Action)

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

Definition of "Migration of Contaminated Groundwater Under Control" EI

A positive "Migration of Contaminated Groundwater Under Control" EI determination ("YE" status code) indicates that the migration of "contaminated" groundwater has stabilized, and that monitoring will be conducted to confirm that contaminated groundwater remains within the original "area of contaminated groundwater" (for all groundwater "contamination" subject to RCRA corrective action at or from the identified facility (i.e., site-wide)).

Relationship of EI to Final Remedies

While Final remedies remain the long-term objective of the RCRA Corrective Action program the EI are near-term objectives which are currently being used as Program measures for the Government Performance and Results Act of 1993, GPRA). The "Migration of Contaminated Groundwater Under Control" EI pertains ONLY to the physical migration (i.e., further spread) of contaminated groundwater and contaminants within groundwater (e.g., non-aqueous phase liquids or NAPLs). Achieving this EI does not substitute for achieving other stabilization or final remedy requirements and expectations associated with sources of contamination and the need to restore, wherever practicable, contaminated groundwater to be suitable for its designated current and future uses.

Duration / Applicability of EI Determinations

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

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2. Is **groundwater** known or reasonably suspected to be “**contaminated**”¹ above appropriately protective “levels” (i.e., applicable promulgated standards, as well as other appropriate standards, guidelines, guidance, or criteria [e.g., Maximum Contaminant Levels (MCLs), the maximum permissible level of a contaminant in water delivered to any user of a public water system under the Safe Drinking Water Act]) from releases subject to RCRA Corrective Action, anywhere at, or from, the facility?

If yes - continue after identifying key contaminants, citing appropriate “levels,” and referencing supporting documentation.

If no - skip to #8 and enter “YE” status code, after citing appropriate “levels,” and referencing supporting documentation to demonstrate that groundwater is not “contaminated.”

If unknown - skip to #8 and enter “IN” status code.

Rationale and Reference(s):

The SECO Products facility is located in the northern edge of the Ozark geomorphic province of east-central Missouri (U.S. Department of Agriculture [USDA] 1989), in the alluvial flood plain of the Missouri River. It is underlain by about 95 feet of unconsolidated Pleistocene and Holocene alluvium, with clays and silts predominating at the surface and silts and sands with discontinuous clay layers at depth (Reed and Associates 1989). In general, the sediments are finer-grained on the southern side of the plant boundary (near MW-6) and coarser-grained on the north side of the plant (MW-5 area) (Reed and Associates 1989). The site was originally characterized as having three discrete aquifers—“shallow,” “middle,” and “deep” (Reed and Associates 1989); however, the Revised Remedial Investigation Report by Shannon and Wilson in 1995 found that the separate shallow and middle aquifers are not laterally continuous. A revised terminology of upper aquifer (incorporating the previous shallow and middle aquifer) and lower aquifer (comprised of the deep aquifer) was proposed (Shannon and Wilson 1995; Environmental Resources Management [ERM] 2004a). The lower aquifer appears to be isolated from the upper aquifer by an intervening clay layer from 60 to 75 feet below ground surface (bgs). The thickness of the clay layer varies from 10 to 35 feet (Reed and Associates 1989). The thickness and permeability of the clay layer separating the upper and lower aquifers make it a confining layer with respect to contaminant migration (Shannon and Wilson 1995). In addition, the deep alluvial aquifer is reported to be artesian with an upward gradient; therefore, site contamination should not impact this aquifer (ERM 2004a). Water levels across the site vary from about 10 to 20 feet bgs (Shannon and Wilson 2001, 2002a, 2002b). The MDNR well registry does not list any drinking water wells drilled into the shallow alluvial aquifer (Jacobs Engineering 1988; MDNR 2005). The primary water-bearing aquifer of the region is the Eminence-Potosi bedrock aquifer. Municipal water wells for the City of Washington draw from this aquifer (Jacobs Engineering 1988).

Contaminants released at SECO Products facility as a result of improper handling or storage included acids and metals associated with electropolishing operations, and solvents associated with vapor degreasing and herbicide application (Shannon and Wilson 1995). Ongoing sampling of groundwater from the upper alluvial aquifer at the SECO Products facility has revealed concentrations of TCE and its degradation products (see Figure 3 of Appendix A for sample locations)—DCE and VC—in excess of their EPA MCLs of 0.005 milligram per liter (mg/L) (TCE), 0.07 mg/L (DCE), and 0.002 mg/L (VC). In 1989, before groundwater recovery and remediation began, the highest concentration of TCE at the facility was 98 mg/L in a sample collected from well MS-2 (Reed and Associates 1989).

¹“Contamination” and “contaminated” describes media containing contaminants (in any form, NAPL and/or dissolved, vapors, or solids, that are subject to RCRA) in concentrations in excess of appropriate “levels” (appropriate for the protection of the groundwater resource and its beneficial uses).

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Since remediation began, concentrations of TCE and its degradation products generally appear to have declined over time. Some increases in concentrations have occurred, however, that are likely the result of increased precipitation and seasonal flooding that flushes TCE, DCE, and VC from the vadose zone (Shannon and Wilson 1995, 2001, 2002a, 2002b, 2003; ERM 2003, 2004a, 2004b, 2005). Appendix B shows changes in TCE concentrations over time in samples collected from the recovery wells; however, concentrations of TCE in excess of the MCL of 0.005 mg/L still are found in monitoring and recovery wells throughout the facility. The highest concentrations of TCE are found in Well MS-2 located just west of the former lagoon. Figures 3 and 6 of Appendix C show isoconcentration maps of TCE in groundwater at the facility. The highest concentrations of DCE and VC are in samples collected from the recovery and monitoring wells on the western perimeter of the facility. Table 1 summarizes the results from the most recent groundwater sampling event in which concentrations of TCE exceeded its MCL.

TABLE 1

**TRICHLOROETHENE CONCENTRATIONS IN GROUNDWATER DURING THE
NOVEMBER/DECEMBER 2004 SAMPLING EVENT**

Well	Well Type	Trichloroethene EPA Maximum Contaminant Level (mg/L)	Trichloroethene Concentration (mg/L)
MS-1	Monitoring	0.005	0.0011
MS-2	Monitoring	0.005	17.0
MW-3	Monitoring	0.005	0.0033
MW-4	Monitoring	0.005	0.017
MW-5	Monitoring	0.005	0.062
MW-6	Monitoring	0.005	0.35
RW-1	Recovery	0.005	0.26
RW-2	Recovery	0.005	0.037
RW-3	Recovery	0.005	1.3
RW-4	Recovery	0.005	0.0024
RW-5	Recovery	0.005	0.22 J
RW-6	Recovery	0.005	0.13 J
RW-7	Recovery	0.005	0.2
SWGWS/DS	Monitoring	0.005	0.027

Notes:

Source: ERM. 2005. "Annual Progress Report and Semi-annual Status Report (Second Half 2004) Groundwater and Remediation System Monitoring. SECO Facility, Washington, Missouri." February 15.

EPA U.S. Environmental Protection Agency
mg/L milligrams per liter

J Estimated value, result less than reporting limit

Bold values indicate concentrations that exceed the EPA MCL of 0.005 mg/L.

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Additional well data of concentrations estimated by the laboratory not shown.

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3. Has the **migration** of contaminated groundwater **stabilized** (such that contaminated groundwater is expected to remain within “existing area of contaminated groundwater”² as defined by the monitoring locations designated at the time of this determination)?

- If yes - continue, after presenting or referencing the physical evidence (e.g., groundwater sampling/measurement/migration barrier data) and rationale why contaminated groundwater is expected to remain within the (horizontal or vertical) dimensions of the “existing area of groundwater contamination”²).
- If no (contaminated groundwater is observed or expected to migrate beyond the designated locations defining the “existing area of groundwater contamination”²) - skip to #8 and enter “NO” status code, after providing an explanation.
- If unknown - skip to #8 and enter “IN” status code.

Rationale and Reference(s):

Groundwater flow under the facility currently is controlled by the SECO Products groundwater remediation system. Groundwater generally flows to the northwest and is now largely influenced by the remediation system (Shannon and Wilson 1995, 2001, 2002a, b). Appendix D shows maps of the piezometric contours calculated from 2003 and 2004 sampling events. The remediation system of seven recovery wells was installed in 1990. The system pumps water from the upper aquifer, treats the water using an air stripper system to remove TCE and then discharges the treated water to Dubois Creek (Reed and Associates 1989). SECO Products now operates five recovery wells as part of the remediation system – RW-1, RW-2, RW-4, and RW-5 on the western boundary of the facility, RW-3 on the northwestern boundary of the facility, and RW-6 and RW-7 on the southern boundary of the facility (Shannon and Wilson 1995, ERM 2005). These five wells operate 24 hours per day, removing between 1 and 9 gallons per minute in each well (Shannon and Wilson 1995).

In December 2003, additional sampling was conducted to determine if contamination exists in the groundwater above the middle silty clay horizon in the upper aquifer directly above the confining clay layer at depths not previously sampled. Six direct-push technology borings were conducted inside the former SECO building and a total of 24 cone penetrometer testing (CPT) samples were collected. Eight CPT samples were installed around the soil vapor extraction system and the other 16 were installed throughout the existing groundwater monitoring network. The sample locations are shown on Figure 3 of Appendix A. The highest total VOC concentrations were detected in samples CPT-106 and B-101 at 1,205 mg/L and 105.6 mg/L, respectively (see Sheet 8 of Appendix C. CPT-106 sample was placed at the upgradient side of the former process wastewater lagoon, situated directly over or adjacent to the location of the former drainage ditch for the solvent recovery system. The solvent recovery system had been reportedly located inside the rear of the plant building near the B-101 boring sample location. Additionally, B-101 is located hydraulically downgradient of the location of the former vapor degreaser that operated until 1999. The discharge from the solvent recovery system to the ground was discovered in 1994. After

² “existing area of contaminated groundwater” is an area (with horizontal and vertical dimensions) that has been verifiably demonstrated to contain all relevant groundwater contamination for this determination, and is defined by designated (monitoring) locations proximate to the outer perimeter of “contamination” that can and will be sampled/tested in the future to physically verify that all “contaminated” groundwater remains within this area, and that the further migration of “contaminated” groundwater is not occurring. Reasonable allowances in the proximity of the monitoring locations are permissible to incorporate formal remedy decisions (i.e., including public participation) allowing a limited area for natural attenuation.

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the discovery, remediation of impacted soils occurred and the solvent vapor recovery system discharge was connected to an air stripper (ERM 2004a).

The current groundwater remediation system appears to have reduced the amount of TCE, DCE, and VC contamination at the facility and has effectively controlled off-site migration of the plume (Shannon and Wilson 2001, 2002a, 2002b; ERM 2003, 2004b, 2004c, 2005). In the five recovery wells, TCE, DCE, and VC concentrations appear to have declined with time (see Appendix B). The western perimeter recovery wells capture contaminants and stabilize migration of TCE, DCE, and VC at the downgradient edges of their plumes. Monitoring wells MW-3 and MW-4, located on the northern perimeter of the facility, have consistently shown decreasing concentrations of contamination in the groundwater since 2001 (ERM 2005). Semi-annual testing of the monitoring wells on the western perimeter of the facility has shown that the pump and remediation system continues to remove and treat impacted groundwater from the subsurface. Analytical results show fluctuating low concentrations of TCE, DCE, and VC. These fluctuations are likely the result of increased precipitation and seasonal flooding (ERM 2005). Isoconcentration surface maps from the last two rounds of groundwater sampling event (see Figures 3 through 8 of Appendix C show cones of depression surrounding these recovery wells. Water levels in the perimeter monitoring wells are drawn down in the recovery process (Shannon and Wilson 1995).

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4. Does “contaminated” groundwater **discharge** into **surface water** bodies?

_____ If yes - continue after identifying potentially affected surface water bodies.

 X If no - skip to #7 (and enter a “YE” status code in #8, if #7 = yes) after providing an explanation and/or referencing documentation supporting that groundwater “contamination” does not enter surface water bodies.

_____ If unknown - skip to #8 and enter “IN” status code.

Rationale and Reference(s):

The nearest downgradient surface water body is Dubois Creek, located along the western margin of the facility. Groundwater flow consistently flows toward the west in the direction of Dubois Creek (ERM 2004b; ERM 2004c; ERM 2005). Recovery wells, also located along the western margin of the facility, control groundwater and associated contamination from migrating off site. Isoconcentration maps from the latest groundwater sampling event (see Appendix C) show cones of depression surrounding these recovery wells, indicating that the wells draw both from groundwater and from the surface water of Dubois Creek. The creek is especially significant as a source of recharge water to the aquifer during times of high water and seasonal flooding (Shannon and Wilson 1995).

Prior to the installation of the groundwater remediation system, surface water samples were collected from upgradient, downgradient, and NPDES outfall locations as part of the 1988 RFA; no detectable concentrations of VOCs were found (Jacobs Engineering 1988).

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5. Is the **discharge** of “contaminated” groundwater into surface water likely to be “**insignificant**” (i.e., the maximum concentration³ of each contaminant discharging into surface water is less than 10 times their appropriate groundwater “level,” and there are no other conditions (e.g., the nature, and number, of discharging contaminants, or environmental setting), which significantly increase the potential for unacceptable impacts to surface water, sediments, or eco-systems at these concentrations)?

_____ If yes - skip to #7 (and enter “YE” status code in #8 if #7 = yes), after documenting: 1) the maximum known or reasonably suspected concentration³ of key contaminants discharged above their groundwater “level,” the value of the appropriate “level(s),” and if there is evidence that the concentrations are increasing; and 2) provide a statement of professional judgment/explanation (or reference documentation) supporting that the discharge of groundwater contaminants into the surface water is not anticipated to have unacceptable impacts to the receiving surface water, sediments, or eco-system.

_____ If no - (the discharge of “contaminated” groundwater into surface water is potentially significant) - continue after documenting: 1) the maximum known or reasonably suspected concentration³ of each contaminant discharged above its groundwater “level,” the value of the appropriate “level(s),” and if there is evidence that the concentrations are increasing; and 2) for any contaminants discharging into surface water in concentrations³ greater than 100 times their appropriate groundwater “levels,” the estimated total amount (mass in kg/yr) of each of these contaminants that are being discharged (loaded) into the surface water body (at the time of the determination), and identify if there is evidence that the amount of discharging contaminants is increasing.

_____ If unknown - enter “IN” status code in #8.

Rationale and Reference(s):

³ As measured in groundwater prior to entry to the groundwater-surface water/sediment interaction (e.g., hyporheic) zone.

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6. Can the **discharge** of “contaminated” groundwater into surface water be shown to be “**currently acceptable**” (i.e., not cause impacts to surface water, sediments or eco-systems that should not be allowed to continue until a final remedy decision can be made and implemented⁴)?

_____ If yes - continue after either: 1) identifying the Final Remedy decision incorporating these conditions, or other site-specific criteria (developed for the protection of the site’s surface water, sediments, and eco-systems), and referencing supporting documentation demonstrating that these criteria are not exceeded by the discharging groundwater; OR 2) providing or referencing an interim-assessment⁵, appropriate to the potential for impact, that shows the discharge of groundwater contaminants into the surface water is (in the opinion of a trained specialists, including ecologist) adequately protective of receiving surface water, sediments, and eco-systems, until such time when a full assessment and final remedy decision can be made. Factors which should be considered in the interim-assessment (where appropriate to help identify the impact associated with discharging groundwater) include: surface water body size, flow, use/classification/habitats and contaminant loading limits, other sources of surface water/sediment contamination, surface water and sediment sample results and comparisons to available and appropriate surface water and sediment “levels,” as well as any other factors, such as effects on ecological receptors (e.g., via bio-assays/benthic surveys or site-specific ecological Risk Assessments), that the overseeing regulatory agency would deem appropriate for making the EI determination.

_____ If no - (the discharge of “contaminated” groundwater can not be shown to be “**currently acceptable**”) - skip to #8 and enter “NO” status code, after documenting the currently unacceptable impacts to the surface water body, sediments, and/or eco-systems.

_____ If unknown - skip to 8 and enter “IN” status code.

Rationale and Reference(s):

⁴ Note, because areas of inflowing groundwater can be critical habitats (e.g., nurseries or thermal refugia) for many species, appropriate specialist (e.g., ecologist) should be included in management decisions that could eliminate these areas by significantly altering or reversing groundwater flow pathways near surface water bodies.

⁵The understanding of the impacts of contaminated groundwater discharges into surface water bodies is a rapidly developing field and reviewers are encouraged to look to the latest guidance for the appropriate methods and scale of demonstration to be reasonably certain that discharges are not causing currently unacceptable impacts to the surface waters, sediments or eco-systems.

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7. Will groundwater **monitoring** / measurement data (and surface water/sediment/ecological data, as necessary) be collected in the future to verify that contaminated groundwater has remained within the horizontal (or vertical, as necessary) dimensions of the “existing area of contaminated groundwater?”

 X If yes - continue after providing or citing documentation for planned activities or future sampling/measurement events. Specifically identify the well/measurement locations which will be tested in the future to verify the expectation (identified in #3) that groundwater contamination will not be migrating horizontally (or vertically, as necessary) beyond the “existing area of groundwater contamination.”

 If no - enter “NO” status code in #8.

 If unknown - enter “IN” status code in #8.

Rationale and Reference(s):

SECO Products has conducted groundwater quality monitoring since the implementation of the groundwater remediation system in 1990. Additional monitoring wells were installed as part of the remedial investigation in 1995 to assess the effectiveness of the groundwater remediation system (Shannon and Wilson 1995). On a semi-annual basis, static water levels and groundwater samples for analysis of TCE, DCE, and VC are collected at all monitoring and recovery wells. TCE, DCE, and VC concentrations generally appear to be decreasing with time (Shannon and Wilson 2001, 2002a, 2002b; ERM 2003, 2004b, 2004c, 2005).

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8. Check the appropriate RCRA Info status codes for the Migration of Contaminated Groundwater Under Control EI (event code CA750), and obtain Supervisor (or appropriate Manager) signature and date on the EI determination below (attach appropriate supporting documentation as well as a map of the facility).

YE - Yes, "Migration of Contaminated Groundwater Under Control" has been verified. Based on a review of the information contained in this EI determination, it has been determined that the "Migration of Contaminated Groundwater" is "Under Control" at the SECO Products facility, EPA ID # MOD068549492, located at Old Highway 100, Washington, Missouri, 63090. Specifically, this determination indicates that the migration of "contaminated" groundwater is under control, and that monitoring will be conducted to confirm that contaminated groundwater remains within the "existing area of contaminated groundwater" This determination will be re-evaluated when the Agency becomes aware of significant changes at the facility.

NO - Unacceptable migration of contaminated groundwater is observed or expected.

IN - More information is needed to make a determination.

Completed by: *Original Signed By* Daniel R. Gravatt Date: 07/25/2005
Project Manager, RCRA Corrective Action & Permits Branch
EPA Region 7

Supervisor: *Original Signed By* Donald Toensing Date: 07/26/2005
Acting Chief, RCRA Corrective Action & Permits Branch
EPA Region 7

Locations where References may be found:

EPA Region 7 Headquarters
RCRA Files
901 North 5th Street
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APPENDIX A
SITE AND SAMPLING LOCATIONS

(3 pages)

APPENDIX B

CONTAMINANT CONCENTRATIONS IN ON-SITE WELLS OVER TIME

(4 pages)

APPENDIX C
CONTAMINANT ISOCONCENTRATION MAPS

(7 pages)

APPENDIX D
PIEZOMETRIC CONTOUR MAPS

(4 pages)