DOCUMENTATION OF ENVIRONMENTAL INDICATOR DETERMINATION

Interim Final 2/5/99

RCRA Corrective Action
Environmental Indicator (EI) RCRIS code (CA750)

Migration of Contaminated Groundwater Under Control

Facility Name:	Greene Tweed and Company
Facility Address:	320 Elm Avenue, North Wales, PA 19454
Facility EPA ID #:	PAD 075 504 795

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

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 "Current Human Exposures Under Controls" EI

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

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

Migration of Contaminated Groundwater Under Control
Environmental Indicator (EI) RCRIS code (CA750)

Facility Background

The Greene Tweed and Company (Greene Tweed) facility began operations at its North Wales location in 1943 as a manufacturer of gasket, packing, and sealing devices. The 11.25-acre property contained two buildings during Greene Tweed's period of operations, which ended in 1987. A third building was constructed at the facility after Greene Tweed sold the property shortly after its operations were discontinued.

The only manufacturing process that generated hazardous waste at the facility was the coating tower operation. The coating process consisted of submerging a 40-inch wide belt of square woven cotton cloth into a rubber cement tank to completely coat the cloth. At the end of a production order, the rubber cement remaining in the tank was disposed. Additional waste was generated during cleanup of the coating equipment, using toluene.

Wastes were stored in three drum storage areas at the site, all of which were removed from the facility when operations ceased in 1987. No history of releases is known or suspected for any of these storage areas. Greene Tweed operated a #6 fuel oil boiler that was also removed from the facility when it was shut down. Machine parts cleaning was periodically required for proper maintenance activities. The facility utilized a Varsol degreaser for this purpose. The Varsol tank required cleaning approximately once every two years and generated approximately 25-30 gallons of spent Varsol.

Shortly after the facility was closed in July 1987, approximately 900 cubic yards of soil was excavated from a former underground storage tank (UST) location. The soil was contaminated with toluene and petroleum hydrocarbons. An additional 600 cubic yards of soil was later excavated. The excavated soils were stockpiled before being placed and treated in an on-site bioremediation cell. The bioremediation cell was closed with Pennsylvania Department of Environmental Protection (PADEP) approval in 1992.

The former Greene Tweed property has been subdivided into 9 parcels with a total of three different owners. The only hazardous waste currently generated at the facility are waste paints and solvents from an auto body repair shop. The waste paints and solvents are removed from the site on an as-needed basis by Safety Kleen.

2. Is **groundwater** known or reasonably suspected to be "contaminated"[1] above appropriately protective risk-based "levels" (applicable promulgated standards, as well as other appropriate standards, guidelines, guidance, or criteria) from releases subject to RCRA Corrective Action anywhere at, or from, the facility?

_____ If yes – continue after identifying key contaminants, citing appropriate "levels," and referencing supporting documentation.

X 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 (for any media) – skip to #8 and enter "IN" status code.

Rationale and Reference(s):

The former Greene Tweed and Co. property is located within the Gettysburg-Newark Lowlands section of the Piedmont Physiographic Province and is underlain by the sedimentary rocks of the Lockatong Formation and lower beds of the Brunswick Group of the Newark Supergroup. The Lockatong Formation is comprised of alternating layers of shale, siltstone and dolomitic mudstones. The soils beneath the site are described as Made land, and were formed as a result of altering and mixing soils of weathered shale and siltstone.

The facility is located approximately 0.25 miles southeast of EPA's North Penn Area 7 Superfund Site. While none of the contamination contained in groundwater beneath North Penn Area 7 is suspected to occur below the former Greene Tweed and Co. property, several geologic and hydrogeologic studies conducted to investigate the Superfund Site, along with site-related soil boring data, can be used to determine the approximate depth to groundwater and the direction of groundwater flow at Greene Tweed. Precipitation at the site likely infiltrates through the soil and saprolite until it reaches competent bedrock at depths of 12 feet or less. Groundwater in the shallowest part of the bedrock aquifer may be under unconfined or partially unconfined conditions. The depth to static groundwater at the facility is estimated to be 30 feet below the ground surface (bgs). Based on local topography and a groundwater elevation contour map prepared by the U.S. Geological Survey for EPA's North Penn Area 7 Superfund Site, shallow groundwater from beneath the Former Greene Tweed and Co. property flows west toward the Wissahickon Creek.

The only potential release of hazardous contaminants to groundwater at the facility is associated with leaking USTs that once contained toluene and No. 6 fuel oil. The USTs were removed from the site in 1986. All visibly impacted soils were stockpiled and subsequently placed into a bioremediation cell that was closed with PADEP approval in 1992. The highest concentration of toluene in soils remaining on site (contained in the bioremediation cell) was 0.47 mg/kg, which is less than EPA's risk-based soil screening level (SSL) for the protection of groundwater (0.76 mg/kg) for that contaminant. Similarly, the highest concentration of methyl ethyl ketone in soils contained in the bioremediation cell was 0.013 mg/kg which is two orders of magnitude below the 1.2 mg/kg SSL for the protection of groundwater.

A Phase II Environmental Site Assessment (ESA) was completed for L.I.P. Collision, the current owner of the southeastern portion of the former Greene Tweed property, in March 2013. Prior to their removal, the leaking USTs described above were located on what is now the L.I.P. Collision property. Nine soil borings were installed as part of the Phase II ESA and soil samples were collected and analyzed for volatile organic compounds (VOCs) and Polycyclic Aromatic Hydrocarbons (PAHs) from eight of them. Soil boring nos. SB-1 through SB-4 were installed in the vicinity of the former UST locations. No contaminants were detected above their respective method detection limits in the samples

[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).

collected from SB-1 and SB-4. Trace concentrations of chlorinated VOCs were detected in soil samples collected from SB-2 and SB-3; however, the concentrations detected were below both EPA's residential direct contact RSLs and SSLs for the protection of groundwater (assuming a dilution factor of 20 for the SSL calculation). A dilution factor of 20 can be used for source areas up to 0.5 acres in size and is suitable for this evaluation because no source areas are known to currently exist at the former Greene Tweed facility. Trace concentrations of VOCs and PAHs were also observed in samples SB-6 and SB-8, both located in the vicinity of the former bioremediation cell, but again, all of these detections were below EPA's residential direct contact RSLs and all detections except for benzo(a)anthracene in the soil sample collected from SB-6 were below their respective SSLs (assuming a dilution factor of 20). The concentration of benzo(a)anthracene in SB-6 (0.27 mg/kg) was only slightly above the SSL of 0.22 mg/kg, and is well within EPA's allowable risk range for carcinogens. Futhermore, none of the detected contaminants in any of the soil samples collected as part of the Phase II ESA were observed above their respective PADEP soil to groundwater medium-specific concentrations (MSCs) for residential used aquifers.

While there are no site-related groundwater monitoring wells, a production well (depth unknown) was sampled for priority pollutants in May 1987. The only detections in the groundwater sample were phenolics (1.3 µg/l) and zinc (163 µg/l). EPA Region 3's tap water regional screening levels (RSLs) are 5,800 µg/l for phenol and 23,000 µg/l for zinc. EPA's National Secondary Drinking Water Standard for zinc is 5,000 µg/l.

The nearest public supply well is located approximately 1.5 miles northwest of the site. No private domestic wells are known to exist in the site vicinity. North Wales Borough and the surrounding area are served potable water from the North Wales Water Authority.

Based on the above, groundwater contamination beneath the former Greene Tweed and Company facility is not suspected and no receptors relying on groundwater for drinking water purposes in the site vicinity have been identified.

Ref.: Final Environmental Indicator Inspection Report for Greene Tweed & Co., North Wales, Montgomery County, PA, prepared by Tetra Tech, October 2003; Phase II Environmental Site Assessment for L.I.P. Collision, 320 Elm Avenue, North Wales Borough, Montgomery County, prepared by Brickhouse Environmental, March 6, 2013; Altitude and Configuration of the Water-Level Surface in Mesozoic Sedimentary Rocks At and Near the North Penn Area 7 Superfund Site, Upper Gwynedd Township, Montgomery County, PA, prepared by U.S. Geological Survey, 2004; Investigations of the Groundwater System and Simulation of Regional Groundwater Flow for North Penn Area 7 Superfund Site, Montgomery County, Pennsylvania, prepared by U.S. Geological Survey, Version 1.1, April 2015.

3. Has the **migration** of contaminated groundwater **stabilized** (such that contaminated groundwater is expected to remain within "existing area of contaminated groundwater"[1] 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):

[1] "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.

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

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

_____ 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):

5. Is the **discharge** of "contaminated" groundwater into surface water likely to be **"insignificant"** (i.e., the maximum concentration [2] 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 concentration[3] 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 concentration 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 concentrations[3] greater than 100 times their appropriate "level(s)," and if 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):

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

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 implemented[3])?

_____ 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-assessment[4] 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 a "NO" status, 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):

---

[3] 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.

[4] The 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.

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?"

_____ 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):

8. Check the appropriate RCRIS 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).

X	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 former Greene Tweed and Company facility, EPA ID # PAD 075 504 795, located at 320 Elm Avenue, North Wales, PA. 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: (signature) _____ Date 9/20/17

(print) Andrew Clibanoff (EPA Region 3)

(title) RCRA Project Manager

Supervisor: (signature) _____ Date 9-22-17

(print) Paul Gotthold

(title) Associate Director, Office of Pennsylvania Remediation

EPA Region 3

Locations where References may be found:

All reference documents can be found at the USEPA Region III Office in Philadelphia.

Contact telephone and e-mail numbers:

(name)	Andrew Clibanoff
(phone #)	215-814-3391
(e-mail)	Clibanoff.andrew@epa.gov