

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: Philadelphia Coke Co., Inc.
Facility Address: 4501 Richmond Street, Philadelphia, PA 19137
Facility EPA ID #: PAD000427906

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?

- If yes – check here and continue with #2 below.
- If no – re-evaluate existing data, or
- If data are not available skip to #6 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 “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 ground water 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).

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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) from releases subject to RCRA Corrective Action, anywhere at, or from, the facility?

 X 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):

Philadelphia Coke Co., Inc. (PCC) was located at 4501 Richmond Street, Philadelphia, Pennsylvania, on a flat, 63-acre industrial site in the “Bridesburg Section” of Philadelphia. The property is bordered by Richmond, Orthodox, and Buckius Streets, as well as the Delaware River. The main portion of the property, north of the former railroad tracks, is entirely enclosed by a chain linked fence. The property is ten feet above sea level.

The facility had various operations including coke storage, coal storage, coke oven batteries, a rail line, a smoke stack, decanter tar bottoms, gas holders, a boiler house, a machine shop, and other structures and fuel blending operations. The facility was active from January 1929 until its permanent closing on May 12, 1982.

The facility was decommissioned, the structures were dismantled, and various cleanup and closure activities took place from 1982 through 1988, ultimately removing 30,000 tons of contaminated soil and operational related wastes. The site also underwent various environmental investigations including groundwater monitoring and soil sampling activities. Certified closure of the facility was provided to the Pennsylvania Department of Environmental Protection (PADEP) in December 1994. As a result of stabilized groundwater monitoring trends of contamination, PADEP terminated the groundwater monitoring requirement in 1999.

The August 11, 2011 site visit confirmed that all operations of the facility have been decommissioned, dismantled, and removed, with only cracked portions of concrete pads and asphalt paved areas remaining. The entire property is now overgrown with trees, brush and high grasses.

The use of the property currently remains idle, with no development since the facility’s closure. The surrounding properties are mixed commercial, industrial, and residential uses. The property is zoned as a Waterfront Redevelopment District (WRD). The City of Philadelphia Property Assessors website identifies the property as zoned Heavy Industrial. The property is served by public water and sewer.

The groundwater at the facility was observed to be at depths that ranged from approximately 2.2 to 9.4 feet bgs during the 1996 CME sampling. Shallow groundwater resides in a shallow layer (approximately 10 foot thick) of surficial deposits of variable thickness, consisting of natural sands and gravels deposited by the Delaware River, as well as man-made fill materials. Groundwater flow in the upper aquifer does not conform to regional trends. It indicates radial groundwater flows away from a centrally high area near MW-2 with relatively flat gradients (0.002 to 0.006 foot/foot typical) both toward the Delaware River to the east and to the west (WCC, 1993). The site lies over both an upper unconfined aquifer and lower confined aquifer.

Upon the facility’s closure, the impact to soils and subsequently the groundwater were investigated. Impacted were

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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remediated through removals and in-situ methods. Monitoring of the groundwater was conducted on a regular basis with oversight from the PADEP and USEPA, eventually reaching acceptable concentrations to permit the discontinuation of future monitoring after 1999.

Concentrations of the COCs in the site groundwater were generally below the residential used aquifer MSCs, EPA MCLs, and EPA RSLs at the site monitoring wells during the 1996 and 1997 CME investigations except for TCE collected from MW-5 in 1996 and 1997, PCE in MW-5 in 1996, benzene in MW-2R in 1996 and 1997 and MW 6 in 1997, and benzo(a)anthracene, benzo(b)fluoranthene, benzo(a) pyrene, and indeno(1,2,3-cd)pyrene in MW-6 in 1996. In general, groundwater concentrations indicated a general decreasing trend over time at the facility, which was why PADEP allowed the facility to discontinue monitoring after 1999. The concentrations were also below detection levels in groundwater collected from MW-1, MW-3 and MW-4 during 1996 and 1997, which were the perimeter downgradient wells for the facility. Results of the 1996 and 1997 CME are presented in the table below.

PARAMETER (ug/L [±])	1996/1997 CME MONITORING WELL RESULTS						Non-Use Aquifer - Residential MSC	Used Aquifer Residential MSC
	MW-1R	MW-2R	MW-3	MW-4R	MW-5	MW-6		
PAHs	--/ ND	--/ ND	--/ ND	--/ ND	--/ 43	--/ ND	--	--
TCE	ND/ ND	ND/ ND	ND/ ND	ND/ ND	33/ 14	ND/ ND	50	5
PCE	ND/ ND	ND/ ND	ND/ ND	ND/ ND	55/ ND	ND/ ND	50	5
Benzene	ND/ ND	83/ 42	ND/ ND	ND/ ND	ND/ ND	3/ 10	500	5
Ethylbenzene	ND/ ND	1/ ND	ND/ ND	ND/ ND	ND/ ND	2/ 3	70,000	700
Toluene	ND/ ND	ND/ ND	ND/ ND	ND/ ND	ND/ ND	2/ 5	100,000	1,000
TOC (mg/L)	29/ 19	28/ 24.4	12/ 11.2	42/ 45.3	5/ 4.3	8/ 7.2	--	--
TOX	33/ 17.7	42/ 29.5	25/ 20.6	11/ 9.5	71/ 95	6/ 7.1	--	--
pH	7.05/ 6.96	8.45/ 8.17	6.88/ 6.74	6.93/ 6.79	6.39/ 6.6	7.01/ 6.7	--	--
Specific Conductance (umhos/cm)	3,370/ 2,740	2,140/ 1,780	6,640/ 3,630	2,160/ 2,590	293/ 392	1,080/ 828	--	--
Naphthalene	ND/ ND	ND/ ND	ND/ ND	ND/ ND	ND/ ND	ND/ ND	30,000	100
Acenaphthylene	ND/ ND	ND/ ND	ND/ ND	ND/ ND	ND/ ND	ND/ ND	16,000	2,200
Acenaphthene	ND/ ND	ND/ ND	ND/ ND	ND/ ND	ND/ ND	48/ 62	3,800	2,200
Fluorene	ND/ ND	ND/ ND	ND/ ND	ND/ ND	ND/ ND	11.9/ 17.5	1,900	1,500
Phenanthrene	ND/ ND	9.8/ 7.6	ND/ ND	ND/ ND	ND/ ND	ND/ ND	1,100	1,100
Anthracene	ND/ ND	2.1/ 1.5	ND/ ND	ND/ ND	ND/ ND	ND/ ND	66	66
Fluoranthene	ND/ ND	3.12/ 2.61	ND/ ND	ND/ ND	0.78/ ND	1.07/ 0.74	260	260
Pyrene	ND/ ND	ND/ ND	ND/ ND	ND/ ND	ND/ ND	ND/ ND	130	130
Benzo(a)anthracene	ND/ ND	0.17/ 0.14	ND/ ND	ND/ ND	0.25/ ND	0.49/ 0.28	11	0.29
Chrysene	ND/ ND	ND/ ND	ND/ ND	ND/ ND	ND/ ND	ND/ ND	1.9	1.9
Benzo(b)fluoranthene	ND/ ND	ND/ ND	ND/ ND	ND/ ND	ND/ ND	0.44/ ND	1.2	0.29
Benzo(k)fluoranthene	ND/ ND	ND/ ND	ND/ ND	ND/ ND	ND/ ND	0.24/ 0.13	0.55	0.55
Benzo(a) pyrene	ND/ ND	ND/ ND	ND/ ND	ND/ ND	ND/ ND	0.55/ ND	3.8	0.2
Dibenzo(a,h)anthracene	ND/ ND	ND/ ND	ND/ ND	ND/ ND	ND/ ND	ND/ ND	0.6	0.029
Benzo(g,h,i)perylene	ND/ ND	ND/ ND	ND/ ND	ND/ ND	ND/ ND	ND/ ND	0.26	0.26
Indeno(1,2,3-cd)pyrene	ND/ ND	ND/ ND	ND/ ND	ND/ ND	ND/ ND	0.86/ ND	62	0.29

Notes: * All results in ug/L except where indicated; 1996 values from WCC / 1997 values from PADEP.

ND = Not Detected;

-- = not applicable

Reference:

Environmental Indicator Inspection Report for Philadelphia Coke Co., Inc., EPA ID No. PAD004427906,
Prepared by Michael J. Baker Jr., Inc., January 2012

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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)?

 X 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):

Upon the facility's closure, the impact to soils and subsequently the groundwater were investigated. Impacted were remediated through removals and in-situ methods. Monitoring of the groundwater was conducted on a regular basis with oversight from the PADEP and USEPA, eventually reaching acceptable concentrations to permit the discontinuation of future monitoring after 1999.

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 concentrations were also below detection levels in groundwater collected from MW-1, MW-3 and MW-4 during 1996 and 1997, which were the perimeter downgradient wells for the facility. Results of the 1996 and 1997 CME are presented in the table above.

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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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 judgement/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-assessment,⁵ 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.

⁵ 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.

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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?"

_____ 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."

 X If no - enter "NO" status code in #8.

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

Rationale and Reference(s):

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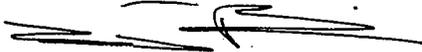
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8. Check the appropriate RCRIS status codes for the Migration of Contaminated Groundwater Under Control EI (event code CA750), and obtain Supervisor (or appropriate Manager) signature and date on the EI determination below (attach appropriate supporting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

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 Philadelphia Coke Co., Inc. facility,
EPA ID # PAD000427906, located at 4501 Richmond Street, Philadelphia, PA 19137.
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 4/10/13
(print) Kevin Bilash
(title) RPM

Supervisor (signature)  Date 4-10-13
(print) ASSOCIATE DIRECTOR, LCD
(title) EPA Region 3

(EPA Region or State) _____

Locations where References may be found:

USEPA Region III
Waste and Chemical Mgmt. Division
1650 Arch Street
Philadelphia, PA 19103

PADEP
South East Regional Office
2 East Main Street
Norristown, PA 19401

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