

DOCUMENTATION OF ENVIRONMENTAL INDICATOR DETERMINATION

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

Migration of Contaminated Groundwater Under Control

Facility Name: Mine Safety Appliances Company
Facility Address: Mars Evans City Road, Evans City, Pa
Facility EPA ID #: PAD# 004 322 913

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).

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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?

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

Rationale and Reference(s):

According to facility representatives, some residents in Callery obtain drinking water from private wells. Some residential areas in Evans City (specifically to the north of the facility) receive municipal water. Drinking water and process water for MSA use is supplied by the municipal system (Draft Phase II RCRA Facility Assessment). Earth Sciences conducted a field reconnaissance to verify the presence of domestic water supplies and extent of municipal water service. No downgradient groundwater users were identified within one mile of the facility (Groundwater Quality Assessment (GWQA) Report, July 9, 1990).

Former Wastewater Surface Impoundments and WWPF

Assessment activities regarding the former wastewater surface impoundments were conducted from January 1989 through June 1990 and are described in a technical report entitled "Groundwater Quality Assessment (GWQA) Report, Evans City Plant", dated July 9, 1990. This report identified groundwater contaminants and their potential sources, verified that there are no downgradient groundwater users, and recommended that the groundwater-monitoring program be modified. The GWQA Report concluded that the WWPF had impacted the shallow aquifer beneath and adjacent to the WWPF. Parameters showing the greatest impact included chloride, sulfate, sodium, calcium, and potassium. In addition, certain volatile organic compounds (VOCs) were detected in three monitoring wells located near the WWPF pipe bridge. These VOCs included 1,1,1-trichloroethane (TCA) and 1,1-dichloroethane (1,1-DCA).

Several significant changes have occurred at the facility subsequent to submission of the July 9, 1990 GWQA report. These changes include (1) clean-closure of the former acid wastewater surface impoundment, (2) installation of a 100,000 gallon wastewater equalization tank, (3) elimination of the plant's NPDES-regulated wastewater discharge to Breakneck Creek, (4) clean-closure of the former caustic wastewater surface impoundment, (5) installation of a 135,000 gallon equalization tank and a lamella clarifier, and (6) clean closure of the remaining two pretreated wastewater settling impoundments.

Groundwater monitoring has been conducted at the facility since April 1987. Groundwater samples were collected on a monthly basis from April through August 1987 and on a quarterly basis from August 1987 to the present. The data report of September 17, 1999 (contained in the package dated March 26, 2001) indicates that the most current VOC data collected July 20, 1999) shows elevated levels of 1,1-DCA (22 ug/l) and 1,1-Dichloroethene (1,1-DCE) (9.6 ug/l) in Well P-107. TCA was non-detect in the monitoring wells.

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).

Rationale/Reference(s) (continued)

Groundwater Control Project

MSA has been routinely meeting with PADEP to discuss a voluntary Groundwater Control (GWC) Project being conducted at the northern end of the site (associated with Building 21 and Outfalls 009). This work is thoroughly discussed in a report recently issued entitled "Interim Technical Summary, Groundwater Control Project" (11/28/01).

CDTI states in the Interim Technical Summary that based on review of available data for the northern part of the facility that "it is apparent that MSA has adequately addressed impacted soil, former SWMUs, and any other continuing sources that were uncovered or disturbed in the B21 and 009 areas". The Interim Technical Summary documents that excavation, removal, and

off site disposal of impacted soil, sludge, and debris was completed in both the B21 and 009 areas. Verification sampling was conducted after the removal of contaminated materials was completed. Consequently, based on remedial efforts and review of the data included in the data Interim Technical Summary, additional soil characterization or remediation is not planned for the continuing GWC Project.

The GWC Project consists of pumping groundwater from the coal/void system and treating it prior to discharge to the Evans City POTW. Groundwater monitoring has been conducted in the B21 and 009 areas since 1998. Current results from samples collected January 19, 01 indicate that Tetrachloroethane (TCA) (96 mg/kg), 1,1 Dichloroethane (DCA) (6.2 mg/kg), and 1,1 Dichloroethene (DCE) (2.9 mg/kg) are at elevated levels in the groundwater. Planned GWC activities will continue to monitor the effectiveness of these controls.

Characterization or remedial efforts have been conducted at other key units in the GWC Project area. A description of the status of the Former Treatment Area 1A, Treatment Area B, Former Treatment Area #4, and the Large Landfill are discussed below. As a result of operational changes and remedial activities at the WWPF, specific groundwater quality-related aspects have been addressed by eliminating most potential sources of groundwater contamination in the vicinity of the WWPF. However, the historical impacts from these units to the environment are not fully known. The status of these areas is described below.

Former Pond No. 1 and 2

Former Pond No. 1 consisted of an approximately 100 foot by 100 unlined earthen basin which received acidic wastewater and sanitary wastewater. Former Pond No 1 was located northeast of B38. An electrical substation now covers the area. Former Pond No. 2 was a similar structure, which received acid and caustic wastewater from facility operations. Former Pond No. 2 was located north of B38. The nature of the closure of these two ponds is unknown, although MSA has a decommissioning procedure on file that was to address pond closure in the late 1970's. As evidenced by recent excavations north of B38, it is likely that some lime-neutralized sludge remains at the former Pond No. 2 location.

Former Pond No. 4

Pond No. 4 was located on the east bank of the Breakneck Creek and south of B20. Former Pond No. 4 consisted of an approximately 100-foot diameter unlined earthen basin, which apparently received caustic waster water and likely, sanitary wastewater. Former Pond No. 4 was presumably closed in a similar manner to Ponds No. 1 and 2. As much as a 20-foot thickness of fill may have been placed within Former Pond No. 4 to bring the area up to grade of the adjacent buildings and roads. The area is now covered with vegetation and soil, a building, or asphalt.

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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):

According to CME reports (dated August 17, 1995) and data from MSA's current environmental consultant, C.D. Tower and Associates, Inc. (CDTI), the rate and extent of contaminant groundwater migration is negligible. The process of closing these settling impoundments resulted in the general containment of the contaminated groundwater. Prior to their installation and in the period of their operation, a natural bedrock mound existed underneath the impoundment location. This caused a mounded groundwater condition with radially outward groundwater flow from the center of the impoundment area. In the process of closing these areas, the site was leveled and the potential groundwater recharge source was eliminated. This resulted in a nearly flat water table with a low gradient.

Closure of the former acid and caustic wastewater surface impoundments and routing plant wastewaters to the two aboveground equalization tanks have effectively prevented spills or releases of wastewater constituents from reaching site groundwater or environmental media. The WWPF currently discharges to the Evans City Borough's POTW and effectively prevents releases to surface water and further lessens potential impact to site groundwater.

The Interim Technical Summary detailing the GWC Project states "that it appears that the existing groundwater pumping is affecting groundwater flow beneath the northern part of the plant, effectively controlling the groundwater migration of contaminants." The identified groundwater plumes are situated within the facility property line and has not migrated offsite. Planned GWC activities will continue to monitor the effectiveness of these controls.

Migration of potentially contaminated groundwater in other areas of the GWC project, specifically Former Ponds Nos. 1, 2, and 4 is controlled by the GWC pumping activities. Historical data indicate that the groundwater plume(s) is contained within the facility property lines.

The GWC area is still under investigation by MSA to optimize the groundwater pump and treat system. On-going activities of the GWC project are focused on 1) defining physical characteristics of subsurface features that control or influence groundwater, 2) identifying potential subsurface contaminants and delineating their lateral and vertical extent, 3) evaluating potential longer-term remedies, and 4) implementing and documenting the selected remedy.

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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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):

Surface water and sediment sampling were conducted at Breakneck Creek on January 23, 3002. A total of 6 sets of surface water and sediments samples were collected upstream and downstream of the facility for VOCs and semi-VOCs. Analytical results indicate non-detects for both the surface water and sediment samples. (*Environmental Indicator Report Additional Data, 3/2002*)

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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)?

	<p>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 <u>key</u> 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.</p>
	<p>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 <u>each</u> 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 "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.</p>
	<p>If unknown - enter "IN" status code in #8.</p>

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)?

	<p>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 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.</p>
	<p>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..</p>
	<p>If unknown – skip to 8 and enter "IN" status code.</p>

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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?"

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):

Quarterly groundwater monitoring for indicator parameters (chloride, ammonia, nitrate, pH, sulfate, specific conductance, total organic carbon, total organic halogens, and dissolved metals, including arsenic, chromium, copper, and lead) and annual monitoring for VOCs is being conducted at the Former Wastewater Surface Impoundments and WWPF area.

Planned GWC investigative activities include: aquifer testing, groundwater monitoring, data evaluation, and potentially additional drilling, well installations, sampling, and pumping system modifications to optimize the effectiveness of the groundwater migration controls. In addition, the facility will continue to conduct surface water sampling in conjunction with the frequency of the groundwater sampling.

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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).

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 Mine Safety Appliance Company facility, EPA ID PAD 004 322 913 located at Mars Evans City Road, Evans City, 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) *Sigma Toth* Date July 2002
 (print) Sigma Toth
 (title) Solid Waste Supervisor

Supervisor: (signature) *Paul J. Gotthold* Date Oct 16, 2002
 (print) Paul J. Gotthold
 (title) Chief, PA Operations
 (EPA Region or State) EPA

Locations where References may be found:

References have been appended to the Environmental Indicator Report and can be found at PADEP's Northwest Regional Office and USEPA's Region III Office

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Facility Name: Mine Safety Appliance Company
EPA ID #: PAD 004 322 913
City/State: Evans City, Pennsylvania

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