

**DOCUMENTATION OF ENVIRONMENTAL INDICATOR DETERMINATION**

**RCRA Corrective Action  
Environmental Indicator (EI) RCRIS code (CA725)  
Current Human Exposures Under Control**

**Facility Name:** Lemean Property Holdings (Formerly Keystone)  
**Facility Address:** 8281 Route 873, Slatington , PA 18080  
**Facility EPA ID #:** PAD 045 137 247

1. Has **all** available relevant/significant information on known and reasonably suspected releases to soil, groundwater, surface water/sediments, and air, 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 #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 "Current Human Exposures Under Control" 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 "Current Human Exposures Under Control" EI are for reasonably expected human exposures under current land- and groundwater-use conditions ONLY, and do not consider potential future land- or groundwater-use conditions or ecological receptors. The RCRA Corrective Action program's overall mission to protect human health and the environment requires that Final remedies address these issues (i.e., potential future human exposure scenarios, future land and groundwater uses, and ecological receptors).

**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. Are groundwater, soil, surface water, sediments, or air **media** known or reasonably suspected to be **“contaminated”**<sup>1</sup> 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 (from SWMUs, RUs or AOCs)?

|                             | <u>Yes</u> | <u>No</u> | <u>?</u> | <u>Rationale / Key Contaminants</u>  |
|-----------------------------|------------|-----------|----------|--|
| Groundwater                 | x          |           |          | Traces of TCE slightly above the max. contaminant level was detected onsite.   |
| Air (indoors) <sup>2</sup>  |            | x         |          | No record of contamination. Low levels of TCE in groundwater do not pose an indoor air concern.                          |
| Surface Soil (e.g., <2 ft)  | x          |           |          | Majority of onsite contaminated soil excavated and disposed offsite. Detection of heavy metals along the drainage ditch. |
| Surface Water               |            | x         |          | Non-detects or low detections of constituents of concern below EPA & PADEP regulatory standards for direct contact.      |
| Sediment                    |            | x         |          | No record of contamination.  |
| Subsurf. Soil (e.g., >2 ft) |            | x         |          | Contaminated soil excavated and disposed offsite.  |
| Air (outdoors)              |            | x         |          | No record of contamination.  |

\_\_\_\_\_ If no (for all media) - skip to #6, and enter “YE,” status code after providing or citing appropriate “levels,” and referencing sufficient supporting documentation demonstrating that these “levels” are not exceeded.

  X   If yes (for any media) - continue after identifying key contaminants in each “contaminated” medium, citing appropriate “levels” (or provide an explanation for the determination that the medium could pose an unacceptable risk), and referencing supporting documentation.

\_\_\_\_\_ If unknown (for any media) - skip to #6 and enter “IN” status code.

**Rationale and Reference(s):**

Air (indoors):

Specific areas in the manufacturing buildings contain asbestos. However, there has been no record of releases from the asbestos that may pose an indoor human health and environmental concern. Low levels of TCE (ND-7.2 ug/L) detected in groundwater do not pose an indoor air vapor intrusion concern. (Phase II Environ. Assessment by Dames and Moore, 1991, 2004 and 2005 RCRA Corrective Action Site Investigation Reports))

Air (outdoors) and Sediment:

There has been no record of releases that are above protective risk-based “levels” by the facility. (EI Report, 2002)

Subsurface Soil:

Contaminated soils associated with the former two solvent USTs and the suspected dumping area were excavated and disposed of off-site. The areas were backfilled with clean fill and naturally re-vegetated. The 20,000 gallon fuel oil was decommissioned and remains on site. Post excavation soil data indicated no contamination above PADEP MSCs and confirms that the USTs and the suspected dumping area were properly closed. (Underground Storage Tank Removal Site Assessment Report, 2000)

Groundwater:

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Sixteen groundwater samples (plus two duplicates) were collected for each sampling event in 2004 and 2005: four permanent monitoring wells (MW-1, MW-2, MW-3, and MW-3 DUP); two production wells (PWS-2 and PWS-4); five temporary well point installations (TEMP-1UST-1, TEMP-2UST-1, TEMP-EP-1, TEMP-SP-1, TEMP-MW-5); and five upgradient residential wells, including one duplicate (RWS-1, RWS-1 DUPE, RWS-2, RWS-3, and RWWS-4). In addition to the onsite sampling wells, four residential wells located upgradient from the facility were also sampled in 2004.

Only one residential well slightly exceeded EPA manganese secondary maximum contaminant level(SMCLs) of 50 ug/L with a detection level of 63 ug/L. EPA does not enforce secondary maximum contaminant levels. These levels are established only as guidelines to assist public water systems in managing their drinking water for aesthetic considerations, such as taste, color and odor. These contaminants are not considered to present a risk to human health. More importantly, the manganese level detected at the residential well is below EPA Region III Risk Based concentration of 730 ug/L, which is the standard established to protect the public against consumption of constituent levels that present a risk to human health. Aside from the one exceedance for manganese all other constituents of concern for the residential wells were below EPA and PADEP drinking water standards.

In 2004, elevated levels of aluminum, which is also a secondary drinking water constituents, were detected in all the onsite wells. The aluminum levels for the permanent wells exceeded EPA standards of 50 ug/L but were well below PADEP Used Aquifer standard of 200 ug/L. In addition to aluminum, the production wells also exceeded secondary drinking water standards for iron and manganese. These contaminants at the detected levels do not present a human health risk.

During the 2004 sampling event several primary metal constituents exceeded drinking water standards in the temporary monitoring wells but not in the permanent wells. In 2005, the wells were re-sampled for the selected primary metal constituents to evaluate the anomaly. The confirmatory groundwater samples identified that the difference in metal detections during the 2004 sampling event was the result of unfiltered samples, which caused an analytical interference. None of the wells sampled in 2005 exceeded EPA and PADEP drinking water standards for the selected primary metal contaminants.

In 2005, only one well slightly exceeded the regulatory standard for TCE . The well detected 7.2 ug/L of TCE and is located within the facility property line. (2004 and 2005 RCRA Corrective Action Site Investigation Reports)

| Constituents of Concern  | EPA/PADEP Stds. | Concentrations (ug/L) |
|--------------------------|-----------------|-----------------------|
| 1,1-Dichloroethylene     | 7               | ND                    |
| cis-1,2-Dichloroethylene | 70              | ND - 0.46             |
| Toluene                  | 1000            | ND - 0.27             |
| trans-1,2-Dichloroethene | 100             | ND                    |
| Trichloroethylene        | 5               | ND - 7.2              |
| Vinyl chloride           | 2               | ND                    |
| Arsenic                  | 10              | ND - 4.5              |
| Beryllium                | 4               | ND                    |
| Cadmium                  | 5               | ND                    |
| Chromium                 | 100             | ND                    |

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|        |     |          |
|--------|-----|----------|
| Lead   | 5   | ND       |
| Nickel | 100 | ND - 7.4 |

Surface Water:

The Lehigh River is located downgradient of the facility and is considered a point of discharge for groundwater. Several surface water locations were sampled along the River. The surface water results indicate extremely low levels to non-detects for the constituents of concern. The River is not impacted from past and current activities at the facility.

In 2005, confirmatory sampling was conducted in and around the Caronel Creek, which is located in the northernmost portion of the site. The results registered non-detects, which confirmed that the initial mercury detection during the 2004 sampling was a result of an analytical false positive. (2004 and 2005 RCRA Corrective Action Site Investigation Reports)

| Constituents of Concern  | EPA/PADEP Stds. | Concentrations (ug/L) |
|--------------------------|-----------------|-----------------------|
| 1,1-Dichloroethylene     | 1500            | ND                    |
| cis-1,2-Dichloroethylene | -               | ND                    |
| Toluene                  | 330             | ND                    |
| trans-1,2-Dichloroethene | -               | ND                    |
| Trichloroethylene        | 450             | ND                    |
| Vinyl chloride           | -               | ND                    |
| Arsenic                  | 150             | 3.8 - 6.6             |
| Beryllium                | -               | ND                    |
| Cadmium                  | 2.6             | ND                    |
| Chromium                 | 10              | ND                    |
| Lead                     | 3               | ND                    |
| Mercury                  | 0.05            | ND                    |
| Nickel                   | 60              | ND - 8.9              |

Surface Soil:

Eight soil samples, including one duplicate were collected adjacent to a drainage ditch that runs west of the former

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Lehigh Railroad tracks. The samples were analyzed for VOCs, SVOCs, and selected heavy metals. No VOCs in soil exceeded EPA generic soil screening levels for residential ingestion/dermal and inhalation. Levels of SVOCs detected in soil do not pose a soil contaminant migration to groundwater as evident from the groundwater sample results.

Several samples detected arsenic levels above EPA and PADEP regulatory limits for industrial use. One soil sample registered a chromium level above PADEP Direct Contact limit of 420 mg/kg but falls below EPA Industrial Generic Soil Screen Limits of 3,400 mg/kg. For the EI determination PADEP standard for chromium supercedes EPA's soil screening limits. In 2005, additional soil samples were collected to delineate the extent of contamination. The results reveal that the area of contamination to be approximately 100 ft<sup>2</sup> and is limited to the vicinity of the former outfall drainage ditch and the railroad tracks. (2004 and 2005 RCRA Corrective Action Site Investigation Reports)

| Constituents<br>(mg/kg) | EPA Industrial<br>Generic SSLs | PADEP Non-Res.<br>MCS Direct Contact | Concentrations    |
|-------------------------|--------------------------------|--------------------------------------|-------------------|
| Arsenic                 | 2                              | 53                                   | <b>ND - 225</b>   |
| Beryllium               | 2,300                          | 5,600                                | 0.46 - 0.61       |
| Cadmium                 | 900                            | 210                                  | 9.2 - 31.4        |
| Chromium                | 3,400                          | 420                                  | <b>130 - 1880</b> |
| Lead                    | ---                            | 1,000                                | 135 - 592         |
| Nickel                  | 23,000                         | 56,000                               | 57.1 - 5,890      |

SWMU-Former Plating Room:

In 1999, several core and chip samples were collected to investigate the condition of the former plating room. The results indicate elevated metal concentrations. Presently, the plating room is not operational. The area is boarded up. The precautionary measure eliminates potential human exposures. In its current state, the plating room does not pose a human health risk or as a contaminant source of release to the environment. In the near future if the plating room were to be re-activated for industrial/commercial use, remediation will be required.

Footnotes:

<sup>1</sup> "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 appropriately protective risk-based "levels" (for the media, that identify risks within the acceptable risk range).

<sup>2</sup> Recent evidence (from the Colorado Dept. of Public Health and Environment, and others) suggest that unacceptable indoor air concentrations are more common in structures above groundwater with volatile contaminants than previously believed. This is a rapidly developing field and reviewers are encouraged to look to the latest guidance for the appropriate methods and scale of demonstration necessary to be reasonably certain that indoor air (in structures located above (and adjacent to) groundwater with volatile contaminants) does not present unacceptable risks.

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3. Are there **complete pathways** between “contamination” and human receptors such that exposures can be reasonably expected under the current (land- and groundwater-use) conditions?

**Summary Exposure Pathway Evaluation Table**

Potential **Human Receptors** (Under Current Conditions)

| <b><u>“Contaminated” Media</u></b> | Residents | Workers | Day-Care | Construction | Trespassers | Recreation | Food <sup>3</sup> |
|------------------------------------|-----------|---------|----------|--------------|-------------|------------|-------------------|
| Groundwater                        | _no_      | _no_    | _no_     | _no_         | _no_        | _no_       |                   |
| <del>Air (indoors)</del>           | ___       | ___     | ___      |              |             |            |                   |
| Soil (surface, e.g., <2 ft)        | _no_      | _no_    | _no_     | _no_         | _no_        | _no_       | _no_              |
| <del>Surface Water</del>           | ___       | ___     |          |              | ___         | ___        | ___               |
| <del>Sediment</del>                | ___       | ___     |          |              | ___         | ___        | ___               |
| Soil (subsurface e.g., >2 ft)      |           |         |          | ___          |             |            | ___               |
| <del>Air (outdoors)</del>          | ___       | ___     | ___      | ___          | ___         |            |                   |

Instructions for Summary Exposure Pathway Evaluation Table:

1. Strike-out specific Media including Human Receptors’ spaces for Media which are not “contaminated” as identified in #2 above.
2. enter “yes” or “no” for potential “completeness” under each “Contaminated” Media -- Human Receptor combination (Pathway).

Note: In order to focus the evaluation to the most probable combinations some potential “Contaminated” Media - Human Receptor combinations (Pathways) do not have check spaces (“\_\_\_”). While these combinations may not be probable in most situations they may be possible in some settings and should be added as necessary.

  X   If no (pathways are not complete for any contaminated media-receptor combination) - skip to #6, and enter “YE” status code, after explaining and/or referencing condition(s) in-place, whether natural or man-made, preventing a complete exposure pathway from each contaminated medium (e.g., use optional Pathway Evaluation Work Sheet to analyze major pathways).

\_\_\_\_\_ If yes (pathways are complete for any “Contaminated” Media - Human Receptor combination) - continue after providing supporting explanation.

\_\_\_\_\_ If unknown (for any “Contaminated” Media - Human Receptor combination) - skip to #6 and enter “IN” status code.

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**Rationale and Reference(s):**

Groundwater:

None of the onsite wells sampled in 2005 exceeded EPA and PADEP drinking water standards for the primary metal contaminants of concern. Only one onsite well slightly exceeded the regulatory standard for TCE . The well detected 7.2 ug/L of TCE. The current owner does not use or intend to use groundwater for potable purpose. Therefore, potential human exposures to groundwater is not reasonably expected under the current conditions.

The residential wells are located upgradient of the facility. Only one residential well detected 63 ug/L of manganese, which slightly exceeds the secondary drinking water standard of 50 ug/L but is well below the EPA Region III Risk Based concentration of 730 ug/L. Aside from the one exceedance for manganese all other constituents of concern for the residential wells were below EPA and PADEP drinking water standards. Therefore, the levels detected in residential wells do not pose a human health risk. (2004 and 2005 RCRA Corrective Action Site Investigation Reports)

Surface Soil:

Several samples detected arsenic levels above EPA and PADEP regulatory limits for industrial use. One soil sample registered a chromium level above PADEP Direct Contact limit of 420 mg/kg but falls below EPA Industrial Generic Soil Screen Limits of 3,400 mg/kg. The extent of contamination is approximately 100 ft<sup>2</sup> and is limited to the vicinity of the former outfall drainage ditch area and the railroad tracks. The area of contamination extends slightly beyond the facility property line. Given the small area and location of the contamination, and the current land use conditions, potential human exposures to the soil contamination are marginal and do not pose a significant health risk.

<sup>3</sup> Indirect Pathway/Receptor (e.g., vegetables, fruits, crops, meat and dairy products, fish, shellfish, etc.)

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4. Can the **exposures** from any of the complete pathways identified in #3 be reasonably expected to be **“significant”**<sup>4</sup> (i.e., potentially “unacceptable” because exposures can be reasonably expected to be: 1) greater in magnitude (intensity, frequency and/or duration) than assumed in the derivation of the acceptable “levels” (used to identify the “contamination”); or 2) the combination of exposure magnitude (perhaps even though low) and contaminant concentrations (which may be substantially above the acceptable “levels”) could result in greater than acceptable risks)?

\_\_\_\_\_ If no (exposures can not be reasonably expected to be significant (i.e., potentially “unacceptable”) for any complete exposure pathway) - skip to #6 and enter “YE” status code after explaining and/or referencing documentation justifying why the exposures (from each of the complete pathways) to “contamination” (identified in #3) are not expected to be “significant.”

\_\_\_\_\_ If yes (exposures could be reasonably expected to be “significant” (i.e., potentially “unacceptable”) for any complete exposure pathway) - continue after providing a description (of each potentially “unacceptable” exposure pathway) and explaining and/or referencing documentation justifying why the exposures (from each of the remaining complete pathways) to “contamination” (identified in #3) are not expected to be “significant.”

\_\_\_\_\_ If unknown (for any complete pathway) - skip to #6 and enter “IN” status code

**Rationale and Reference(s):**

<sup>4</sup> If there is any question on whether the identified exposures are “significant” (i.e., potentially “unacceptable”) consult a human health Risk Assessment specialist with appropriate education, training and experience.

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5. Can the “significant” **exposures** (identified in #4) be shown to be within **acceptable** limits?

\_\_\_\_\_ If yes (all “significant” exposures have been shown to be within acceptable limits) - continue and enter “YE” after summarizing and referencing documentation justifying why all “significant” exposures to “contamination” are within acceptable limits (e.g., a site-specific Human Health Risk Assessment).

\_\_\_\_\_ If no (there are current exposures that can be reasonably expected to be “unacceptable”)- continue and enter “NO” status code after providing a description of each potentially “unacceptable” exposure.

\_\_\_\_\_ If unknown (for any potentially “unacceptable” exposure) - continue and enter “IN” status code

**Rationale and Reference(s):**



**SCOPE OF MORE DETAILED (E.G., SITE-SPECIFIC) ASSESSMENTS OF RISK.**

