



December 16, 2020

To Whom it May Concern,

**Re: 7111 Beth-Bath Pike**

HDR Engineering Inc. (HDR) has been assisting Brookside Commercial Construction (BCC) with environmental due diligence and management of environmental concerns on the property since approximately 2005.

Since that time HDR has completed an ASTM 1527 Phase I environmental due diligence on the property. A Recognized Environmental Condition (REC) was identified due to historical use as a former explosives storage facility. Based on this information, HDR proposed a Phase II Environmental Site Assessment (ESA) to understand if metals or fuel oils related to explosives were present on the property. Following the investigation, only arsenic was found to exceed Pennsylvania Department of Environmental Protection (PADEP) Residential Statewide Health Standards (SHS) (Figure 1).

“Arsenic occurs naturally in soil and minerals, and it therefore may enter the air, water, and land from wind-blown dust and may get into water from runoff and leaching. Arsenic may enter the environment during the mining and smelting of these ores. Small amounts of arsenic also may be released into the atmosphere from coal-fired power plants and incinerators because coal and waste products often contain some arsenic.” (Ref - 1)”

In the Lehigh Valley, arsenic is generally found widespread in soils and can routinely be found above the SHS. As noted above, arsenic in soil can be from both natural and anthropogenic sources. The Lehigh Valley and its history in steel manufacturing and coal use is no exception to the rule and is considered one of the anthropogenic sources of arsenic in many of the soils in the Lehigh Valley.

“Arsenic released from power plants and other combustion processes is usually attached to very small particles. Arsenic contained in wind-borne soil is generally found in larger particles. These particles settle to the ground or are washed out of the air by rain. Arsenic that is attached to very small particles may stay in the air for many days and travel long distances.” (Ref – 1)

**Remedy**

Both the United States Environmental Protection Agency (USEPA) and Pennsylvania Department of Environmental Protection (PADEP) allow for Engineering controls (ECs) to eliminate exposure, such as constructed physical barriers (e.g., soil capping, geotextile fabric, fences) to contain and/or prevent exposure to human health or the environment. An engineered cap can be based on future design but can include:

- Building foundation
- Impervious surface (asphalt parking area and streets, concrete sidewalks)
- 1 foot of landscape material (stone, gravel, rip-rap)



- Or two feet of Clean Fill (landscape topsoil)

Since arsenic is chemically attracted to soil and does not readily degrade, capping of this material is an effective way removing the exposure routes to human health and the environment. For example, some sites where arsenic (and other soil impacts) were effectively controlled using engineering controls are listed below as comparison for your consideration:

- Bethlehem Steel. The redevelopment process included demolition of numerous buildings covering hundreds of thousands of square feet, movement of millions of cubic yards of manmade fill, remediation of former materials handling areas, removal of historical underground chemical handling utilities, and design and environmental coordination required to construct new facilities. To complete the Act 2 process for this facility, HDR successfully demonstrated that the buildings, parking areas, and design of the building provided a sufficient engineering cap for residual metals and compounds including arsenic.
- Slate Belt YMCA. This facility operated since the early 1900's as a railroad maintenance facility. Most of the structure of the existing YMCA building was the former maintenance shops. Soil impacts that were identified on the site included lead, arsenic, and residual oils. PADEP approved the use of an engineered cap to control exposure to arsenic and other soil contaminants. Arsenic concentrations ranging from 50 to 800 ppm were capped with clean fill and a geotextile liner. The engineered cap is part of the design of a soccer field.

It is HDR's experience and opinion that the property can be successfully capped with the proposed design, and that this engineering control and maintenance will be protective of human health and the environment.

Sincerely,



Vincent M. Carbone, PG  
*Professional Geologist*

## References

1. Agency for Toxic Substances & Disease Remedy (ATSDR) [ATSDR - Public Health Statement: Arsenic \(cdc.gov\)](#)