BUREAU OF ENVIRONMENTAL REMEDIATION/REMEDIAL SECTION POLICY

CONSIDERATION FOR HYDRAULIC CONTAINMENT

BER POLICY # BER-RS-028
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ORIGINATOR

Originator: Rick Bean **Date: 6/21/94**

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This policy specifies KDHE requirements for a remedial strategy, known as **hydraulic containment.** Hydraulic containment of groundwater contamination is an active remedial alternative accomplished through ground water withdrawal and treatment within the known area of contamination (contaminant plume). Hydraulic containment may be used in combination with other active remediation alternatives and/or with various passive remediation alternatives.

For hydraulic containment to be considered as a viable remedial option, the Voluntary Party (VP) or the Responsible Party (RP) must provide the following information for KDHE approval:

1. Identification of site risks and receptors, both human and ecological, in a KDHE-approved risk evaluation or assessment.
2. Ground water/surface water hydrogeologic relationships.
3. Complete delineation of vertical and horizontal extent of ground water contamination (a compliance line of contamination should be established).
4. Complete characterization of the impacted aquifer(s) (gradient, velocity, transmissivity, hydraulic conductivity, storativity, etc.).
5. Area water usage.
6. Source identification and delineation.
7. Other site-specific requirements as deemed appropriate by KDHE.

For some sites, specific areas of elevated contamination that exist within a larger area of contamination may be targeted for hydraulic containment. These areas may consist of elevated levels of contamination that are significantly greater than the surrounding areas of contamination. Alternative Treatment Goals (ATGs) for these areas may be developed by KDHE to identify the areas and concentrations of contamination where active remediation will be required to achieve and maintain the site-specific compliance or remedial goals. ATGs will be determined based on site-specific criteria, and may not be approved for all sites. Use of ATGs at a site may require monitoring locations within the area of active remediation in addition to the site compliance points, which are based on the site remedial or corrective action goals. Sites where ATGs are approved will likely have two levels of remedial goals or objectives that must be met, goals within the area of active remediation and overall site goals (e.g. compliance wells on the leading edge of contamination).

The VP or RP must meet the following minimum requirements for hydraulic containment to be approved by KDHE as a remedial component at a site:

1. **Remedy objective(s)** must be clearly stated and approved by KDHE. The primary objective is to maintain compliance-monitoring wells at levels below the MCLs or RSK values and prevent further degradation of the aquifer.

2. A site-specific three-dimensional **Target Capture Zone** capable of meeting the remedy objective(s) for all contaminants of concern (COCs) must be defined.

3. An interior **monitoring network** sufficient to confirm groundwater movement within the contaminant plume and the capture zone must be established. The network should include wells and/or piezometers completed at appropriate vertical intervals adjacent to extraction wells, near the capture zone boundaries, and, if necessary, within the contaminant plume. The monitoring network should be designed so as to determine the actual capture zone and ensure the hydraulic containment system is meeting the remedy objective(s) and operating effectively.

4. **Compliance monitoring** must be conducted along the leading edge(s) of the contaminant plume for the site chemicals of concern COCs at a frequency approved by KDHE. Additional compliance monitoring points within the plume and/or associated with active remediation may be required on a site-specific basis. If any one of the COCs exceeds the MCLs, the RSK values, or the ATGs in the compliance monitoring points, additional remediation may be required by KDHE.

5. **Source control measures** (i.e., soil excavation, aquifer sparging, etc.) must be implemented at all identified source areas to eliminate and/or reduce the toxicity, mobility and volume of the waste/contaminants at the site. Source areas may include free-phase product, waste material, and highly contaminated soil and/or ground water identified as the origin for contamination.

6. **Additional site-specific requirements** as deemed appropriate by KDHE.

7. **Environmental use controls (EUCs)** (KSA 65-1,221 through KSA 65-1,235), including ground water use restrictions in the area of the contaminant plume, must be obtained for the impacted area. Local government ordinances may be passed in order to place restrictions on areas owned by multiple parties.

KDHE may approve termination of hydraulic containment once the remedial goals, or ATGs if applicable, have been achieved and are continuously sustained over at least a one-year period in the compliance monitoring points. Once the hydraulic containment has been terminated, **long-term monitoring** will be required until MCLs or RSK values are achieved and sustained in accordance with the criteria in KDHE's Reclassification Plan Policy #BER-RS-024. Once remedial and monitoring goals have been met, the RP may request reclassification under BER's Reclassification Plan Policy (BER-RS-024).

KDHE will not consider this innovative remedial strategy if active drinking water supply wells are impacted or threatened. Also refer to BER policy #BER-RS-045 entitled, "Considerations for Groundwater Use and Applying RSK Standards to Contaminated Ground Water."