

DEPARTMENT OF ENVIRONMENTAL RESOURCES  
Hazardous Sites Cleanup Program

RESPONSE TO PUBLIC COMMENTS

J. C. Cleaners Site  
April 11, 1994

The Department provided a public comment period concerning the selection of the remedial response at the J.C. Cleaners Site. This public comment period commenced with the August 7, 1993 publication of the Notice of Proposed Response in the *Pennsylvania Bulletin*. Written comments were accepted during the comment period which extended until November 8, 1993. No written or oral comments were received during the public hearing held on September 29, 1993. The Gettysburg Municipal Authority's consultant Gannett Fleming presented the following written comments.

**Comment #1:** Based on past experience with interference between wells located in the Gettysburg Formation and the information reviewed, the Authority believes some well interference will occur at Well No. 6 as a result of pumping at the proposed extraction well(s). It is evident that the J.C. Cleaners site lies within the zone of influence of Well No. 6, based on the groundwater gradient measured by Baker and the presence of tetrachloroethane (PCE) in Well No. 6. Pumping groundwater from the proposed extraction well(s) will remove groundwater currently recharging Well No. 6. The Well No. 6 zone of influence will expand to compensate for the loss in recharge and thereby cause an increase in drawdown. An increase in drawdown may also reduce the specific capacity (gallons per minute per foot of drawdown) of Well No. 6.

The DER suggests that hydraulic connection between water-bearing zones is poor and that deeper water-bearing zones in Well No. 6 (350-900 feet), may not be substantially affected by pumping in the upper 350 feet at the proposed extraction well(s). While this may be true, drilling records, developed by Eichelbergers, Inc., show at least three water bearing zones exist in the upper 350 feet of Well No. 6. The upper water-bearing zones may be intersected and pumped by the proposed extraction well(s) and thereby reduce their present yielding capabilities at Well No. 6.

It is very difficult to predict how much interference will occur without knowing aquifer characteristics derived from long term testing at the proposed extraction well(s). Even results from long term testing can be misleading because the Gettysburg Formation is a fractured bedrock aquifer and is highly heterogeneous and anisotropic. The DER has scheduled short duration packer testing and borehole geophysics to be performed on a new and existing monitoring wells at the J. C. Cleaners site. The field tests should identify bedrock structure orientations and help refine what pumping rates are needed to maximize drawdown in the proposed extraction wells if the remedial operations are implemented. The Authority insists that it receive the results of the scheduled field testing. If significant quantities of groundwater are proposed to be extracted and treated at the J.C. Cleaners site, the Authority will insist that the DER plan to pipe the treated groundwater to Well No. 6 for distribution. Accordingly, the Authority would need to have some control of the J. C. Cleaners treatment facility. Furthermore, if project planning

continues, the Authority wishes to review future testing results, analyses and design reports for the project.

**RESPONSE:** While a reduction in specific capacity of Well no. 6 is possible, the Department does not believe that proposed groundwater extraction will adversely impact Well No. 6. If an adverse impact were to occur after long term pumping as began, various remedies would be available to reduce or mitigate the impact.

The low levels on contaminants present in Well No. 6 versus high contaminant levels found in monitoring wells close to the dry cleaners indicate that contaminated water that would be pumped and treated by the extraction well is only a small fraction of the yield from Well No. 6. The large volume of uncontaminated water required to dilute the contamination to the levels found in Well No. 6, as opposed to those found on site, is an indication that the municipal well relies on other areas within its zone of influence for the majority of its yield. Consequently, the volume of highly contaminated groundwater that would be intercepted by the extraction well at the dry cleaner should have a very minor effect on the yield of the well.

The Department will provide GMA a copy of the final report on recent field activities. The Department has already provided GMA access to previously completed reports.

The Department does not feel that piping the treated water to GMA for distribution is a alternative that should be undertaken at this time. There are several reasons for this. First, the treated water will, at least initially include shallow groundwater and water from the soil vapor extraction unit. This would be considered surface water that could not be used without filtration. Secondly, pumping the water to the GMA is a more expensive option than discharging to the storm sewer system.

A contract for operation and maintenance of a constructed extraction and treatment system will be implemented in the future. GMA with its local presence, trained operators and overall knowledge would be in a good position to operate the treatment system. This can be discussed with GMA at a time when the particulars of the treatment operation and maintenance are defined. If another third party is selected to operate the treatment system, the Department will work with GMA in addressing concerns both before and after operation of the system has begun.

**COMMENT #2:** The VOC contaminants that the DER has identified at the J. C. Cleaners are dense nonaqueous phase liquids (DNAPLs). DNAPLs have greater densities than water and are relatively insoluble in water. Therefore, the density of DNAPLs allow them to migrate down through the structural features of the aquifer (i.e. bedding planes, joints and fractures) without regard to groundwater flow. The tabular feature of the Gettysburg Formation would facilitate the DNAPLs to migrate down dip (northwest) toward Well No. 6. The Department should identify the orientation of the bedrock structures and be aware of their ability to govern the migration of the contaminants.

The relatively insoluble nature of DNAPLs alone (not knowing the quantity of contaminants released) suggests that pump and treat remediation would be required for a very long time at the J.C. Cleaners site and at Well No. 6. If the remedial operations are implemented, the

Authority insists that the DER include Well No. 6 in its routine monitoring of groundwater chemistry. The Authority would want to know if the operations are changing the groundwater chemistry, particularly at Well No. 6. As discussed above, the Authority would expect to receive copies of the laboratory analysis reports presenting the concentrations of the parameters tested by the DER.

**Response:** As the flow of groundwater is heavily influenced by fractures in the bedrock it is difficult to precisely predict groundwater flow. Besides the migration of DNAPLs down dip, the high groundwater extraction from Well No. 6 is a major influence on the flow and spread of contaminants.

Well No. 6 was sampled during field activities that occurred during December 1993. When the report of these field activities is completed, the Department will provide GMA with a copy. The Department can provide GMA with a copy of future analysis of samples taken from Well No. 6. The zone of influence of Well No. 6 is many times larger than the zone of influence from the proposed extraction well, and changes in chemistry would likely be the result in watershed changes and/or increased pumping by GMA and not pumping from the extraction well. Information on groundwater chemistry is obtained from compliance monitoring required for municipal water supply Well No. 6. This compliance monitoring is the proper means of insuring adequate water quality and also showing changes that should be monitored more closely.

**Comment #3:** If the proposed groundwater remedial operations are implemented and treated groundwater from the extraction well(s) is not piped to Well No. 6 for distribution, the Authority will request compensation from the DER for expenses incurred to offset any well interference that may occur at Well No. 6. The Authority is currently investigating its needs to increase water supply to satisfy projected demands. The Authority must endure the expenses involved with meeting these requirements and should not bear the onus of additional expenses relating to lost yields at Well No. 6 caused by well interference. The Authority may need to request compensation from the DER to offset costs associated with lowering the pump in Well No. 6, operation of a deeper well pump, investigating alternative water sources, etc.

**Response:** Based on available information, the Department does not believe that the proposed extraction of groundwater will have a detrimental impact on Well No. 6. If extraction well does interfere with the yield from Well No. 6, the Department will discuss possible remedies with the Gettysburg Municipal Authority at that time.

**Comment #4:** The Gettysburg Municipal Authority opposes the proposed deep groundwater containment and extraction remedial operations at the J.C. Cleaners site. The Authority supports the DER's objectives to remediate the groundwater to levels consistent with the PA Groundwater Protection Strategy and to eliminate any further leaching of the hazardous substances into groundwater. The opposition is primarily with regards to the remedial operations potential to interfere with the present quantity of groundwater available at Well No. 6.

**Response:** The GMA authority will in the long term be a major beneficiary of the proposed work. The goal of the cleanup is to remove contamination from the groundwater. When this is accomplished, the cost incurred to GMA

in operating and maintaining the existing air stripper will end. The Department believes that any potential interference with Well No. 6 will be minimal and in a worst case scenario be able to be addressed in a manner that facilitates both the cleanup of the site and GMA's continued withdrawal of groundwater.