

**OFFICE of DRINKING WATER and MUNICIPAL ASSISTANCE**  
**INSTRUCTIONS for VIEWING WHPAs**

Utilizing an automated ground water modeling process and existing State of Michigan databases the Office of Drinking Water and Municipal Assistance (ODWMA) was able to greatly expand the number of approved wellhead protection areas (WHPAs) for public water supply systems. We now have 2,694 delineated WHPAs consisting of 1,416 WHPAs for non-transient, non-community public water supplies and 1,278 WHPAs for community public water supplies. Due to this expansion in numbers it is no longer possible for the ODWMA to maintain a database of WHPAs consisting of individual .pdf files. To address the demand for access to this information the ODWMA has developed a protocol that can be used to obtain access through a geographic information system (GIS) environment to all 2,694 WHPAs.

**ArcGIS Explorer**

If you do not already have access to a GIS application, the first step is to download an application with the ability to import standard format "shapefiles." The Department of Environmental Quality provides all staff with the public domain software ArcGIS Explorer developed by ESRI. ArcGIS Explorer is relatively user friendly and useful as a GIS platform for viewing and performing basic queries and analysis of the information contained within a shapefile. The software can be downloaded from the web at:

<http://www.esri.com/software/arcgis/explorer/download>

**Michigan Geographic Data Library**

A shapefile of the 2,694 WHPAs is available from the Michigan Department of Technology, Management and Budget, Center for Shared Solution and Technology Partnerships (DTMB, CSSTP) website at:

<http://www.mcgi.state.mi.us/mgdl/?rel=thext&action=thmname&cid=19&cat=Wellhead+Protection+Areas>

The file on the website is a "zipped" version of the files needed to construct the shapefile. To download the shapefile perform the following steps:

- Create a folder on the C: drive of your computer to provide a location for storing the files.
- Navigate to the website address above and click on the link "Michigan Wellhead Protection Areas". A pop-up will appear. Do not open the files. Click on the Save tab.
- Save the file to the folder you have created on your C: drive. Note the file you are saving is a zipped or compressed file named "Wellhead\_Protection\_Areas".
- Once saved, navigate to the folder, right click on the zipped file and open/extract the file to the same location. Extracting the file will create 7 new files ending with the suffixes .dbf, .prj, .sbn, .sbx, .shp, .xml and .shx that comprise the WHPA shapefile.

**Loading the Shapefile**

Open ArcGIS Explorer. When opened the map extent may cover considerably more area than Michigan. The map extent will be changed when you import the WHPA shapefile. To do so, be sure the "Home" toolbar is being displayed. You should see tools at the top of the display such as Start Presentation; Edit Presentation; Find; Directions, Route and Measure; Folder, View, Link, etc.

To import the WHPA shapefile, click on the "Add Content" button – this button may be embedded within a "Map" button that provides access to a dropdown menu. A drop down menu should appear from which you select "Shapefiles..." A pop-up will then appear allowing you to navigate to the drive locations on your computer and/or network. Navigate to the location where you have stored the

extracted WHPA shapefiles. By default, the program will display the one of seven files needed to import the WHPA shapefile into ArcGIS Explorer. Click on the file. The map extent will automatically alter to show the geographic extent of Michigan. WHPAs will appear as polygons on the map that contain the following fields.

- AREA – area of the wellhead protection area in square miles,
- WSSN – water supply serial number, a 5 to 7 digit number unique to the public water supply,
- SYSTEM – public water supply system name (i.e. – city or system name, business, etc.),
- TYPE – a label related to the manner in which the WHPA was identified,
- DATE – the date the WHPA was added to the shapefile.

Information on a specific WHPA may be obtained by clicking on the WHPA within the map extent. To navigate to a specific WHPA the user is directed to the “Tools” tab. Within the tools tab the “Query” button may be used to navigate to a specific WHPA based upon the information contained within the above mentioned fields.

As an example, in viewing the southern half of the Lower Peninsula of Michigan (Figure 1) a query may be constructed to display the WHPAs for just the Lansing Board of Water and Light (WSSN 03760). The query as constructed in Figure 2 when executed adds the WHPAs for the LBWL to the “Contents” in the left hand margin of Figure 3. Deactivating the “WHPA” layer leaves just the WHPA for the Lansing Board of Water and Light displayed on the map (see Figure 3).

