APPENDIX B - GIS METHODS

The following information relates specifically to the GIS methods involved in the prioritization. To minimize repetition between this section and the prioritization results section, we maintained the same general format (i.e., same subheadings) so they can be readily compared. We do not discuss sections that are self-explanatory. We chose not to use a raster model of assigning strict values to the different variables. Assigning values can be quite biased and limiting. By assessing importance values, you are also excluding areas that may be desirable for other reasons. We instead chose to highlight areas with desirable sites, leaving shapefiles on the individual elements, so the reviewer can do their own assessment and modifications if desired. We were not able to incorporate elevation data because sufficient elevation GIS data for this region does not yet exist. It may be released by the end of 2004, at which point, it would be desirable to incorporate it into the consideration.

Priority 1 restoration sites

1) **Hydric soils**: We selected only hydric soils (based on the website http://www.sawgal.umd.edu/nrcsweb/Maryland/index.htm) from the NRCS soil survey data (*hydric.shp*).
2) **Rank hydric soils from #1** (*hydric.shp*): Although we ended up using only the soil rankings based on "very poorly drained" and "poorly drained" for the general prioritization, a shapefile was created that does rank the NRCS soil data into more fine-tuned ranking as found in the table.
3) **Exclude prime farmland when drained on agriculture**: We selected hydric soils on prime farmland when drained (this was the only prime farmland type on hydric soils - Fallsington) and created the shapefile (hydprime.shp). From Landuse 2002, we selected for land use does not equal agriculture. We erased (xtools) this land from the hydric soils on prime farmland when drained. The remaining polygons were hydric prime soil when drained on agriculture. We used this file to erase the areas from the original hydric soil layer. This resulted in a layer with hydric soil but no prime farmland when drained on agricultural land (*hynoprag.shp*).
4) **Within Green Infrastructure network**: We selected "very poorly drained" soils from #3 (hynoprag.shp) that were within the Green Infrastructure hub or corridor (xtools clip). This

layer (called *hy3gir34.shp*) are very poorly drained hydric soils, without prime farmland when drained on agriculture, within the GI network.

5) **Exclude areas currently in forest**. We intersected (xtools) hy3gir34.shp with our 2002 MOP land use shapefile, and selected only land use types of urban, agriculture, and barren land. This layer (*hy3girlu.shp*) excludes forest.
6) **Exclude areas currently in wetland**: We unioned the MDNR and NWI wetland layers (excluding MDNR classified farmed wetlands). (Wowet.shp). We erased these wetlands from the layer hy3girlu.shp to get *hy3grlnw.shp*. We deleted areas <1 acre and areas on forest (according to DOQQ, that were mistakenly included when using MDOP data).
7) **Include zoning with restrictions on development lot size and include protected land**. We selected all zoning other than Resource Conservation, Agriculture, or Estate to be our area of non-inclusion. From the shapefile, we removed the protected lands owned by the county, state, federal, private conservation, and Maryland Environmental Trust. We overlayed this resulting shapefile (*Antizpro.shp*) on top of the polygons under consideration, so we would not select priority sites here.
8) **Exclude MDE-designated wellhead protection areas.** We overlayed the wellhead protection areas shapefile on top of the other areas, so we would not select priority sites here.
9) **Look for additional sites on orthophoto based on the below criteria.** We looked for areas with the highest concentration of these desirable elements:
    - **Adjacent to or within Green Infrastructure network**. We visually assessed the proximity to GI network, favoring polygons that would contribute to the GI network if restored. If an area was separated from the GI network by a narrow strip of less-desirable soil, it could still be considered for restoration.
    - **Adjacent to streams with no forest/wetland buffer (with pollutant source)**: We made a stream buffer (150 ft similar to that used by DNR during the WRAS process) intersected with MDOP 2002 landuse (xtools) to get the landuse type within the 150 foot stream buffer. We selected portions of the stream buffer having urban, agriculture, or barren land. We then intersected this layer with our hydric soil layer to get only sections of the stream with urban, agriculture, or barren land within 150 feet of the stream on hydric soil (*st150luh.shp*). We used the DNR Coastal Bays stream layer for this procedure. This layer does not include some of the small ditches (largely intermittent) but corresponds well with the orthophotos. The stream layer with the

detailed ditches (Tiner data) lined up very poorly with the orthophoto, so we were not able to use it for the GIS analysis (since in some cases, the drawn ditch was >40 meters from the ditch shown on the orthophoto).

- **Adjacent to wetlands or other natural systems** We used stream and wetlands shapefiles, and orthophotos.
- **Pollution source**: We looked for areas that were a pollution source themselves or were downstream of a pollution source using orthophotos and MDOP land use data.
- **MDNR farmed wetlands**. We looked for areas with a high concentration of farmed wetlands using the MDNR wetland shapefile (created shapefile with only farmed wetlands *wowetpf.shp*).

10) **Consider actual property lot size**: Property size of the above highlighted sites was based on the MDOP Propertyview layer.
11) **In areas of poor water quality**: We created shapefiles ranking general areas of poor and moderate water quality using summary data from State of the Bays Report, TMDL recommendations, and MDNR synoptic surveys.

Protected land: We merged the protected land shapefiles including private conservation, Maryland Environmental Trust easements, federal, state, and county land. We then selected areas on hydric soil (xtools intersect) and removed the MDNR and NWI wetlands (xtools erase) from these sites. This resulted in polygons (*prohynw.shp*) that are protected, on hydric soil, and not currently designated as wetlands.