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10/26/2011

GIS Project Status Report

The objective of this report is to relay the current status of my GIS project and detail any remaining hindrances to its completion as outlined in the project proposal, submitted September 29, 2011. Project scope has been modified slightly from the proposal in that the investigation of land-applied field slope using digital elevation models will be occluded from the final report. This decision was made because it is peripheral to the rest of the study. In other words, assessing the potential of phosphorus contamination from runoff distracts from the more important goal of investigating sources of nitrogen contamination of groundwater. The following briefing will focus on several factors including:

- Basemap Completion
- Monitoring Well XY-coordinate Projection
- Monitoring Well Data Completeness

Basemap Completion

The project basemap includes NHD flowlines, HUC-8 and -12 watersheds, TWDB major aquifers, and the Travis County political boundaries. Each feature class was pared down to those features within Travis County limits, with the exception of TWDB major aquifers which were left intact to give an idea of how the aquifer flows on a macroscopic level. The ESRI topological basemap was added to the GIS to provide geographical context. The project basemap is shown in Figure 1 with all basemap layers turned on except TWDB major aquifers.

Monitoring Well XY-coordinate Projection

XY-data were obtained from a 1994 Groundwater Monitoring Report performed by consulting engineers that designed the well installation. This XY-data is not in shapefile format and has no metadata or projection coordinate system. XY-Data is simply provided as have Easting and Northing Directions. The data were assumed to be projected in the State Plane Central Texas coordinate system; however, upon implementation of the data, the well points were rendered in the Pacific Ocean. As a workaround, the well point features can be georeferenced to ortho-imagery in ArcGIS or appropriate geographic coordinates can be obtained by locating well pads in Google Earth.

Monitoring Well Data Completeness

Chemical data for the monitoring wells were obtained from the City of Austin; however, groundwater depth information from each sampling event has apparently misplaced and must be tracked down to adequately represent depth changes as a function of time. The only groundwater depth data that is readily available are those from the most recent sampling event in June 2011. If this data cannot be located, the June 2011 groundwater depth data may still be useful if the increased groundwater levels correspond to elevated ammonia levels, and thus further implicating a leak in a lagoon.

Figure 1: Basemap featuring NHD flowlines, HUC-8 and -12 watersheds in the vicinity of Hornsby Bend, which is indicated in the ESRI Topological layer. Note the 3 lagoon treatment systems located near the Colorado River. Ultimately, the GIS project hopes to provide insight into whether ammonia contamination of wells is related to leaching of these lagoons.