

# Lake Jim Thornton & Marvin Fenn Pond

Lake Survey  
&  
Contour Creation



# LAKE JIM THORNTON



**MARVIN FENN POND**

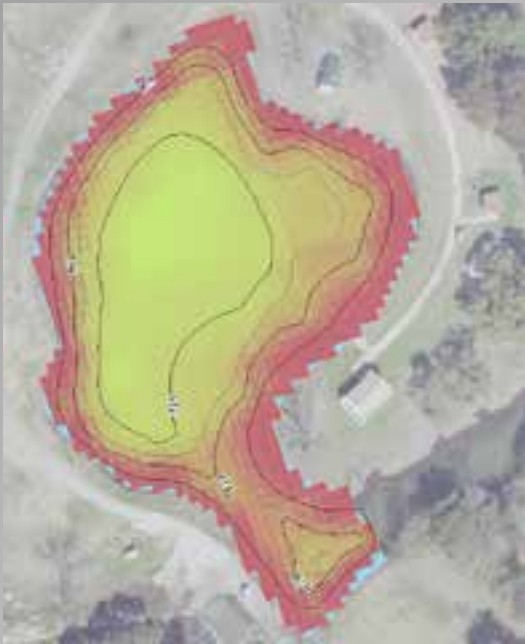
**Marvin Fenn Pond & Lake Jim Thornton**

**In a few  
short  
minutes,  
with  
information  
gathered  
from both  
the  
Engineering  
& Mapping  
Divisions,  
you will  
learn.....**

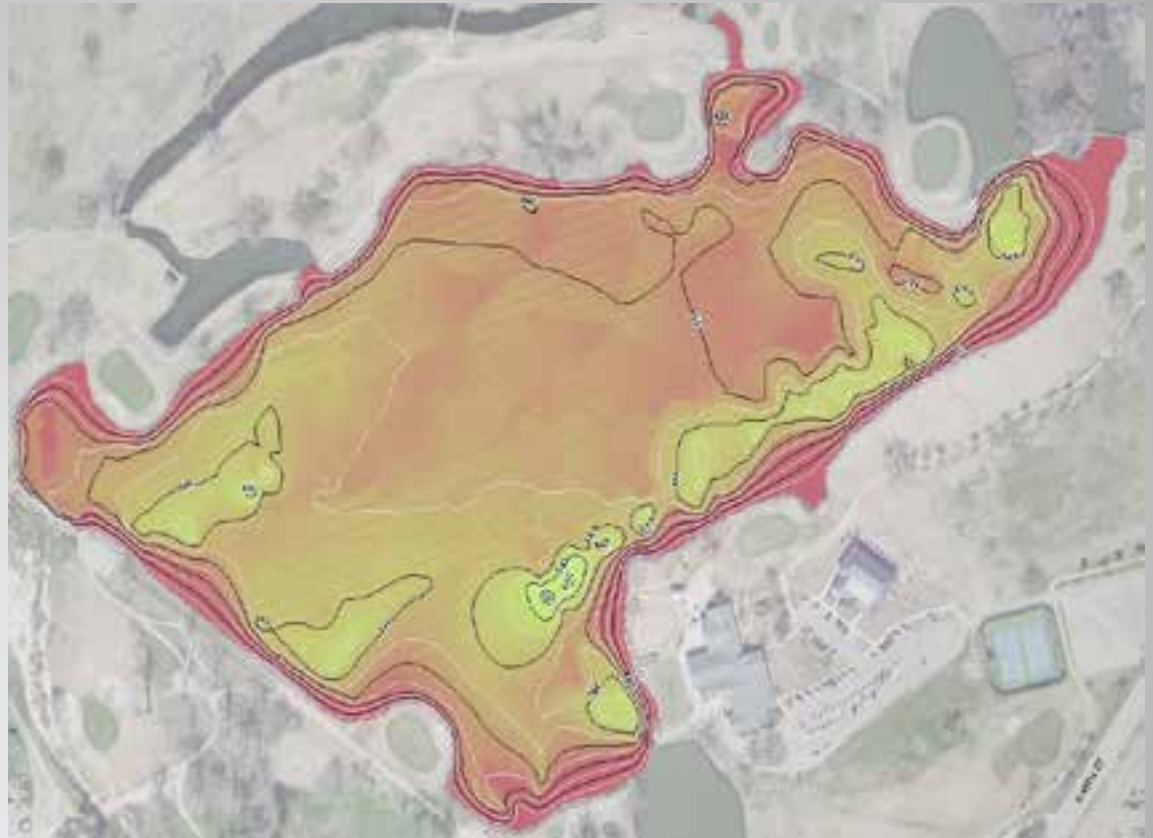


**How We Turned This:**

# Into This!



**MARVIN FENN POND**



**LAKE JIM THORNTON**

- Mapping Division in conjunction with Engineering Division were tasked to perform a survey of the bathymetry in Sammons Golf Park to estimate storage capacities of Lake Jim Thornton and Marvin Fenn Pond as well as create contours of the water feature bottoms.
- The tools used to record the data were a Hondex Digital Depth Sounder and a Trimble GeoXH GPS unit. The data was recorded over the course of 3 days in mid-May 2011 following a major rain storm which filled both water features to capacity.
- Using a paddleboat, trolling motor, and one representative of both Engineering and Mapping, respectively, one person recorded depth while the other recorded the location with the GPS and recorded depth into the attributes.

## Step 1



**HONDEX DIGITAL DEPTH SOUNDER**



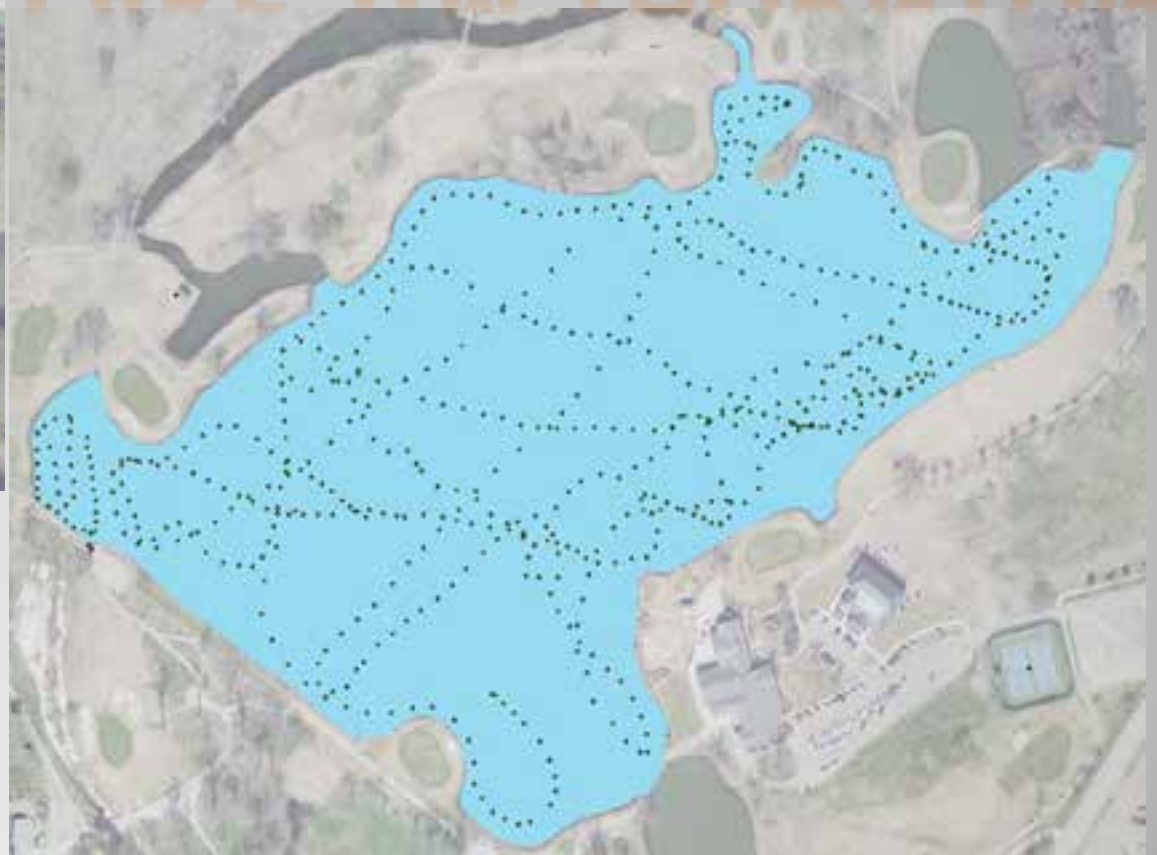
**TRIMBLE GEO-XH**

**Tools Used To Collect Data:**



**MARVIN FENN POND**

# **LAKE JIM THORNTON**



**GPS'd Points-From Step 1**

- In order to reach the end goal of creating contours, we first had to create a raster image which reflected the depth of the water bodies. To create the raster image we had to convert the existing Lake Jim Thornton and Marvin Fenn Pond polygons into point features. This was accomplished by utilizing tools in the ArcToolbox.
- In the Data Management toolbox we used the Feature to Point Tool from the Features Toolset. Once converted to points, a depth field was created and the outside elevations of the water bodies were entered which was 652 for Lake Jim Thornton and 618 for Marvin Fenn Pond (This elevation was taken from existing contour data).
- Next we merged the converted point features with our recorded GPS points. From there we created an elevation field that showed the elevation of the bottom of the water bodies. This was calculated to be:  $\text{Outside Elevation} - \text{Recorded Depth} = \text{Bottom Elevation}$ .

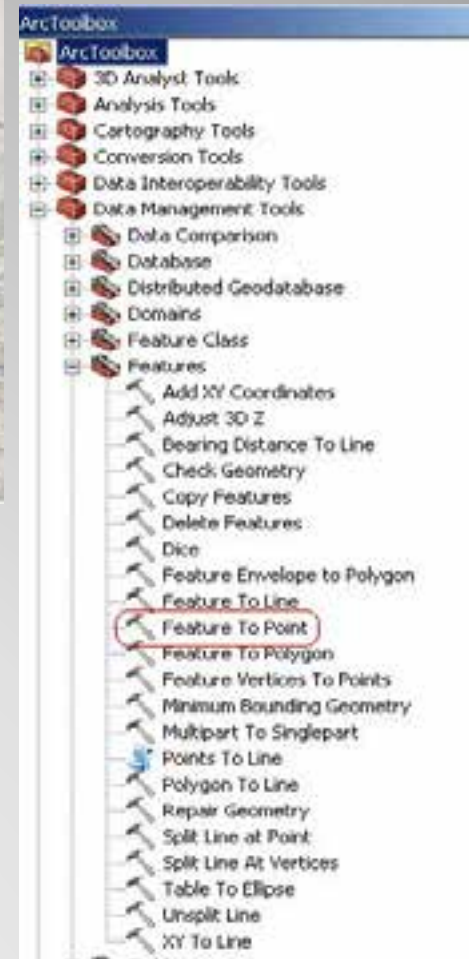
## Step 2:



# LAKE JIM THORNTON



## MARVIN FENN POND

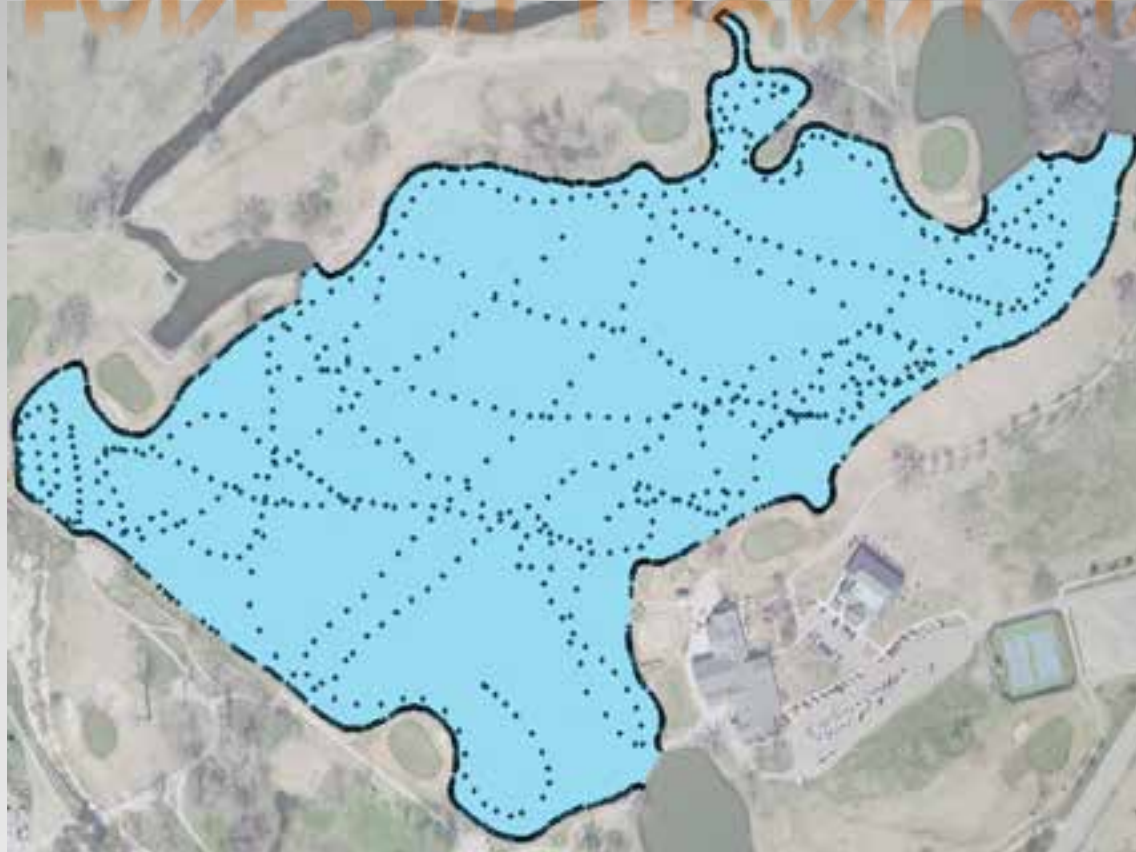


# Conversion of Polygon to Points



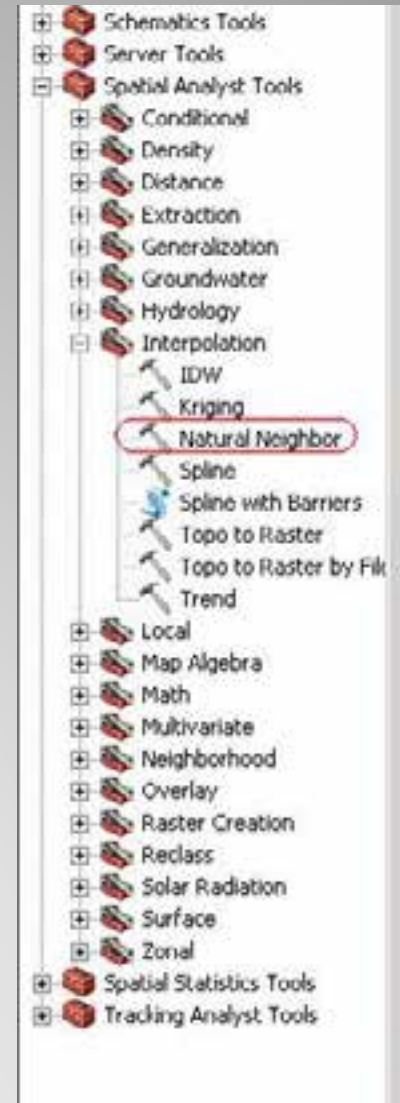
**MARVIN FENN POND**

# **LAKE JIM THORNTON**

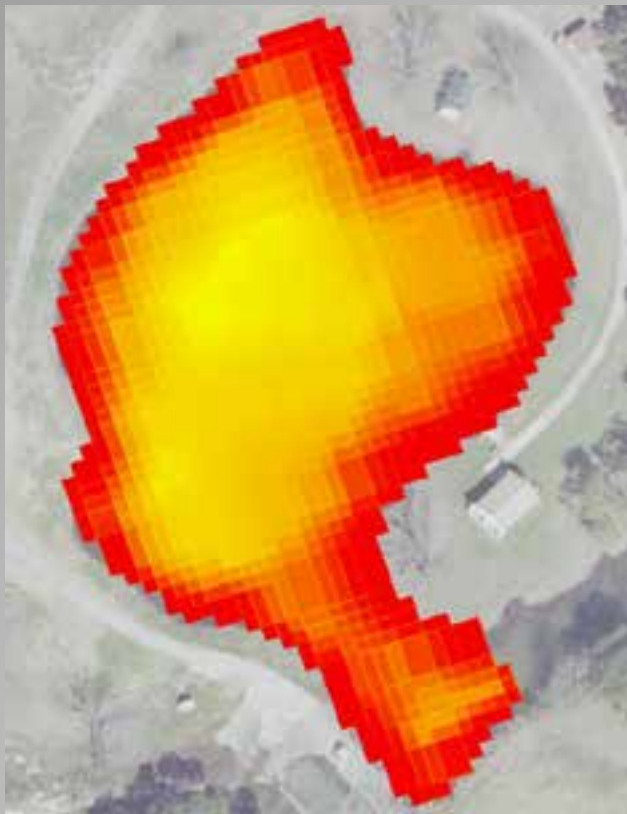


**Outside of Features Converted To Points**

- All that was left for us to do before we could create the contours was to create a raster image. Using the Spatial Analyst toolbox we interpolated the data by using the Natural Neighbor Tool in the Interpolation Toolset.
- By creating a raster image we are now able to determine the bottom elevation of the water features at any given point in the raster image.

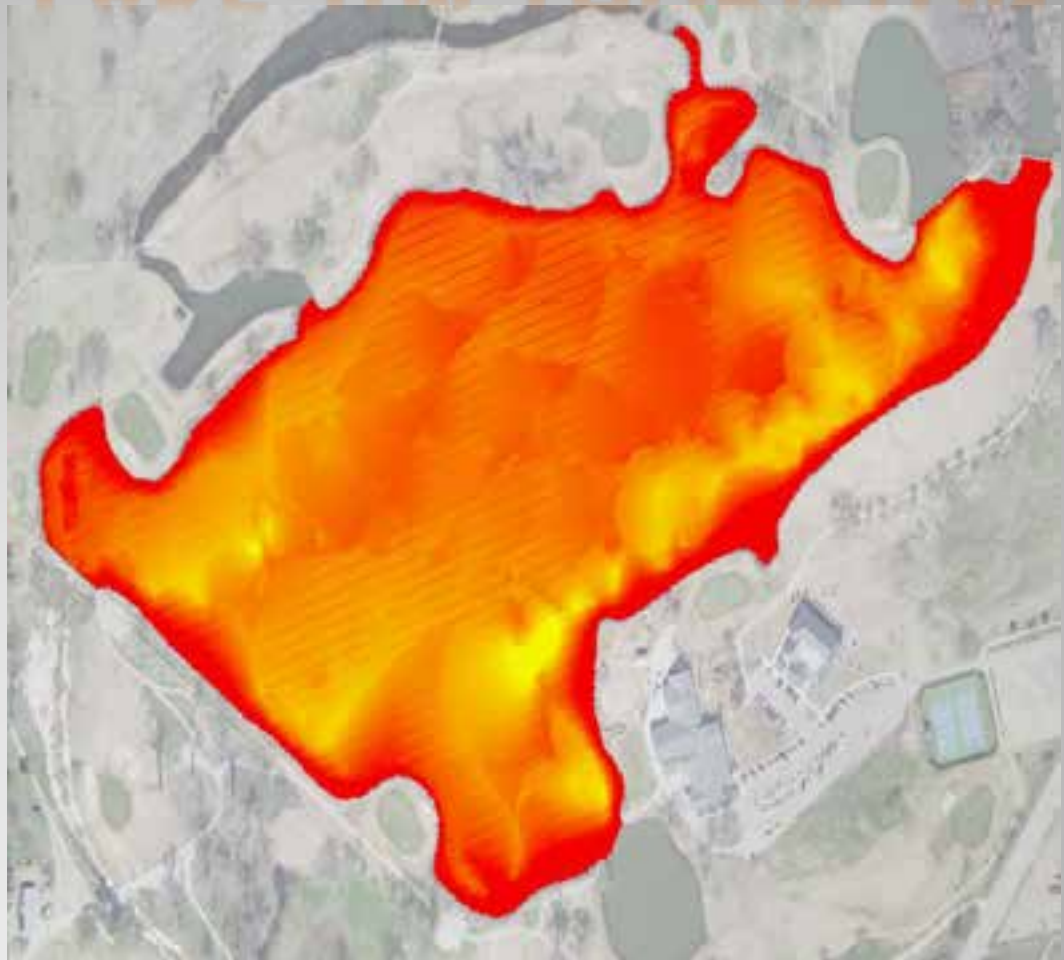


## Step 3:



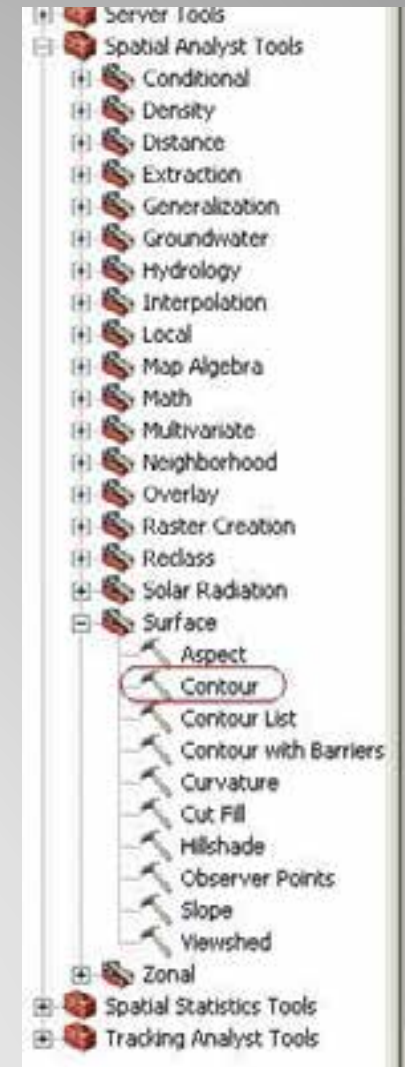
**MARVIN FENN POND**

**LAKE JIM THORNTON**

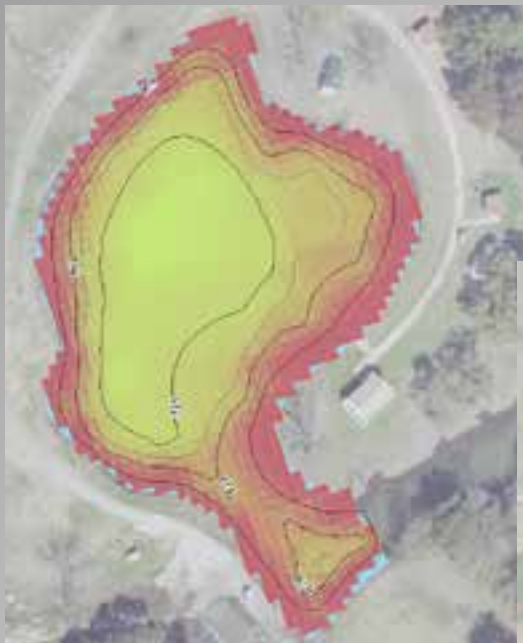


# Raster Image Creation

- Our final step was the creation of the actual contours so that storage capacity could be calculated. Again, using Spatial Analyst we used the Contour Tool in the Surface Toolset.
- We set our contour interval to "1", since we were working with such a relatively small area, and our base contour was 652 for Lake Jim Thornton and 618 for Marvin Fenn Pond.

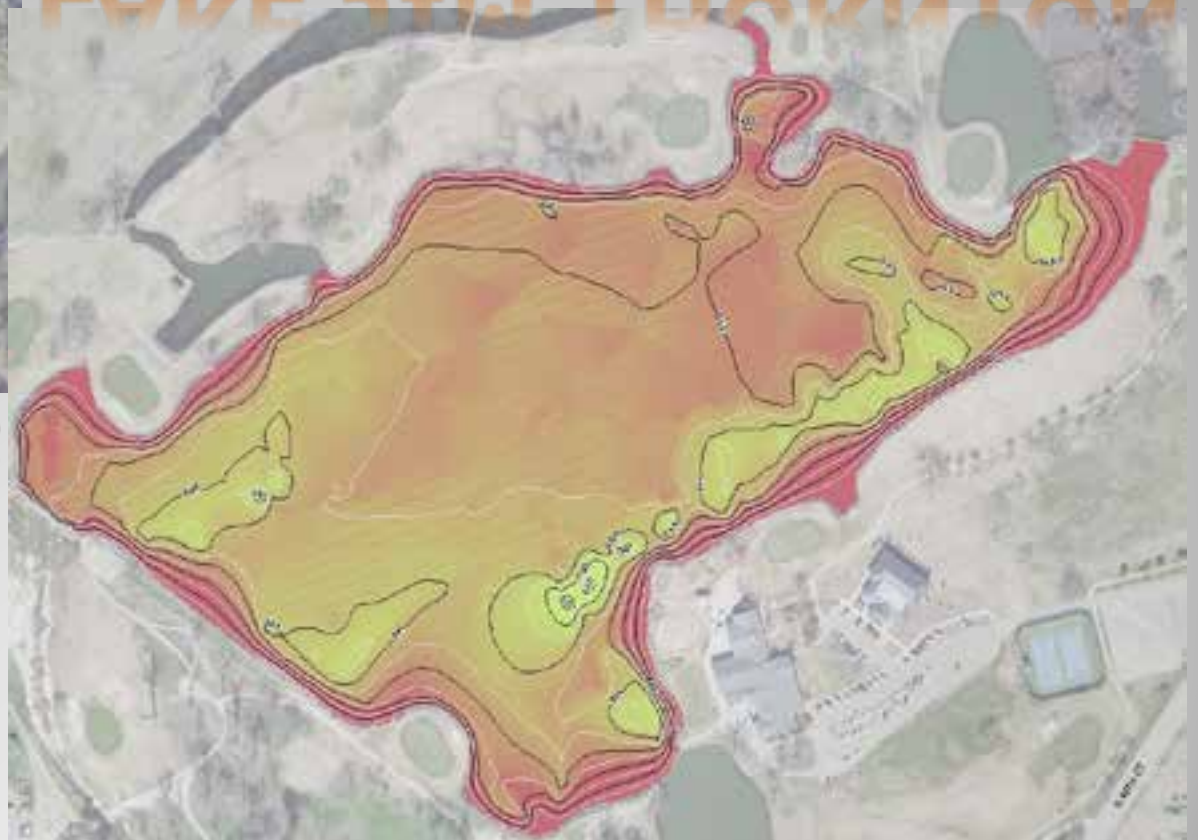


## Step 4:



**MARVIN FENN POND**

# **LAKE JIM THORNTON**



**Contours**

- Upon completion of gathering and converting the data, the capacity of Lake Jim Thornton was calculated to be approximately 47.86 million gallons on 25.48 acres. Depths for this water body ranged from 3 to 12ft deep. Marvin Fenn Pond was calculated to be approximately 1.72 million gallons on 1.39 acres. Depths for this water body ranged from 1 to 6ft deep.
- Since Lake Jim Thornton is the primary supplier of water for Sammons Golf Park irrigation, Engineering calculated the time it would take for the water body to go dry assuming there was no precipitation to recharge the water body. At minimum irrigation flow of approximately 1.4 million gallons a week it would take 34 weeks to empty; moderate irrigation flow of 1.75 million gallons a week it would take 27 weeks to empty; ideal irrigation flow of 2.5 million gallons a week would take 19 weeks to empty.

## Calculations

# Questions

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**Contact Information**