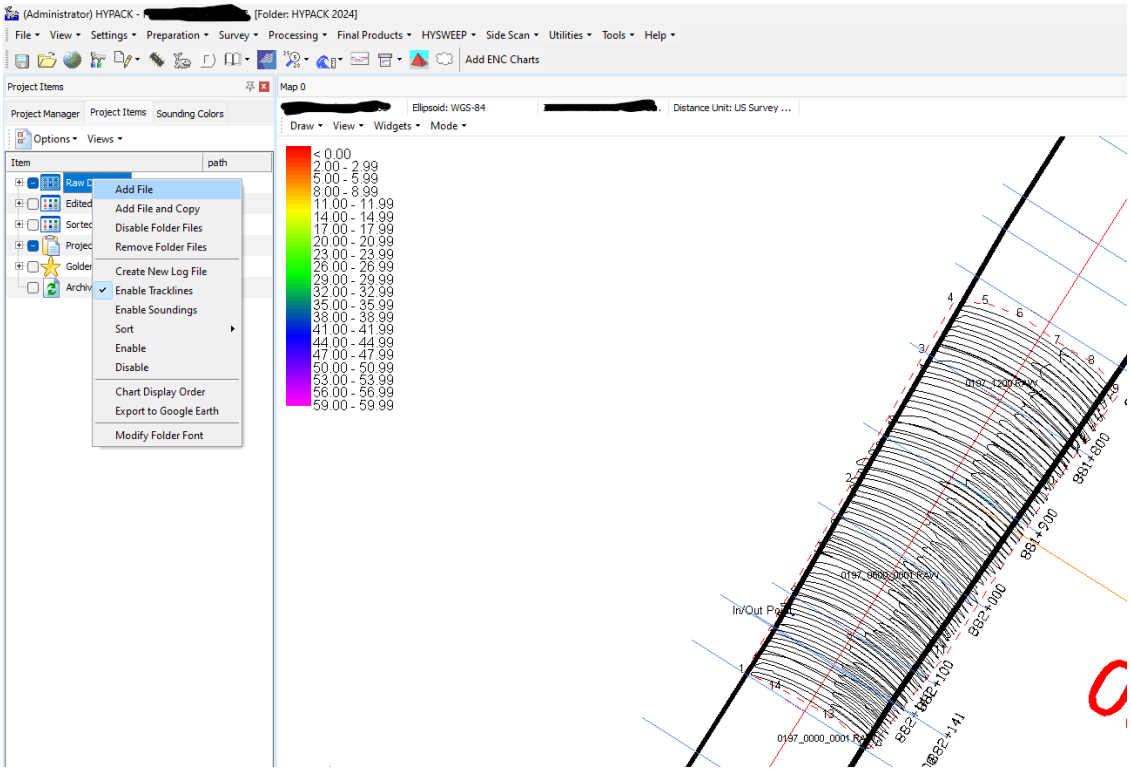
Obtaining Dredge Volumes by Day

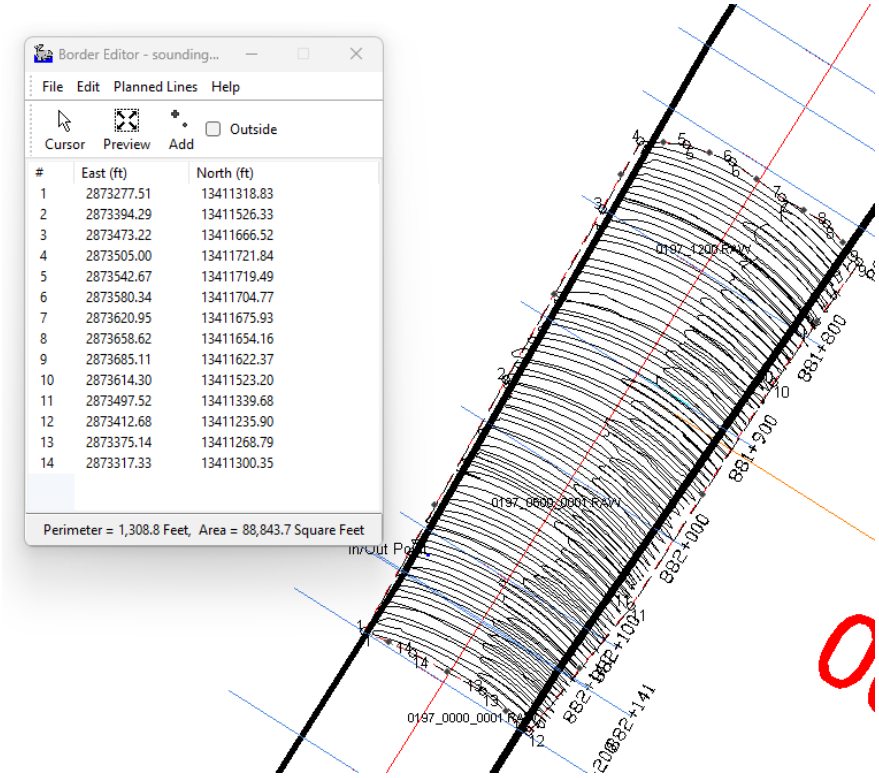
By Thelen Pumford

For dredge projects it's often necessary to calculate or estimate dredged volumes for a given day. Luckily, HYPACK® has some useful tools in order to do this. To get started with the method I'm going to show you, the dredge needs to have logged the RAW data while operating in DREDGEPACK®.

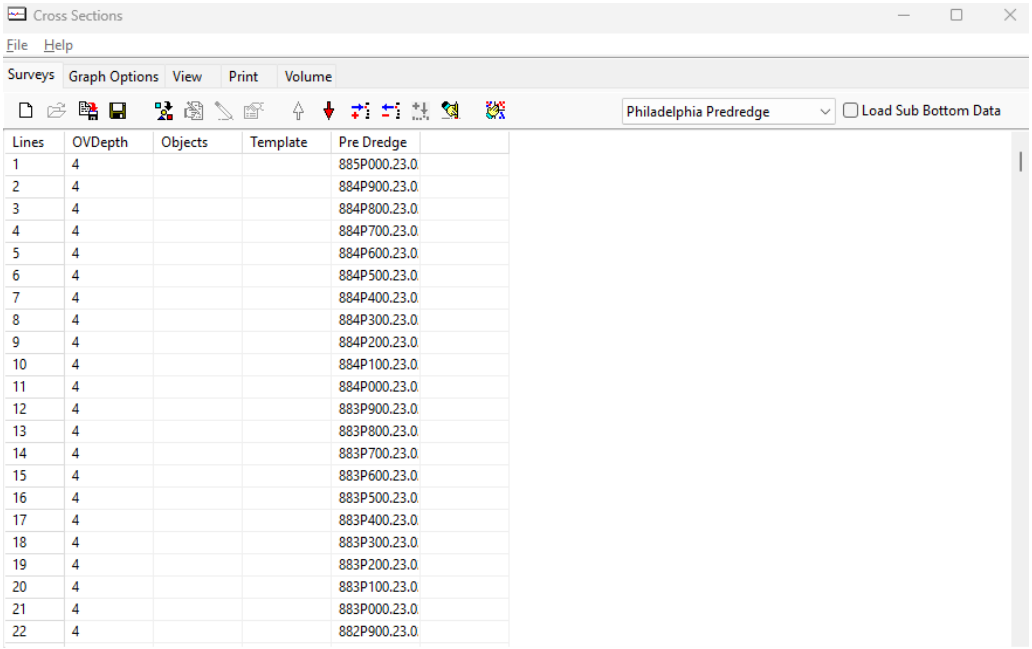
If it was, perfect! If not, this method will not work for you. Assuming you have the RAW data from the dredge, lets go ahead and load in that file for the day you are trying to calculate a volume for. You can do this by right clicking the item Raw Data Files, then click Add File and select your RAW data file. Also, make sure you have the Enable Tracklines option checked and Enable Soundings unchecked.



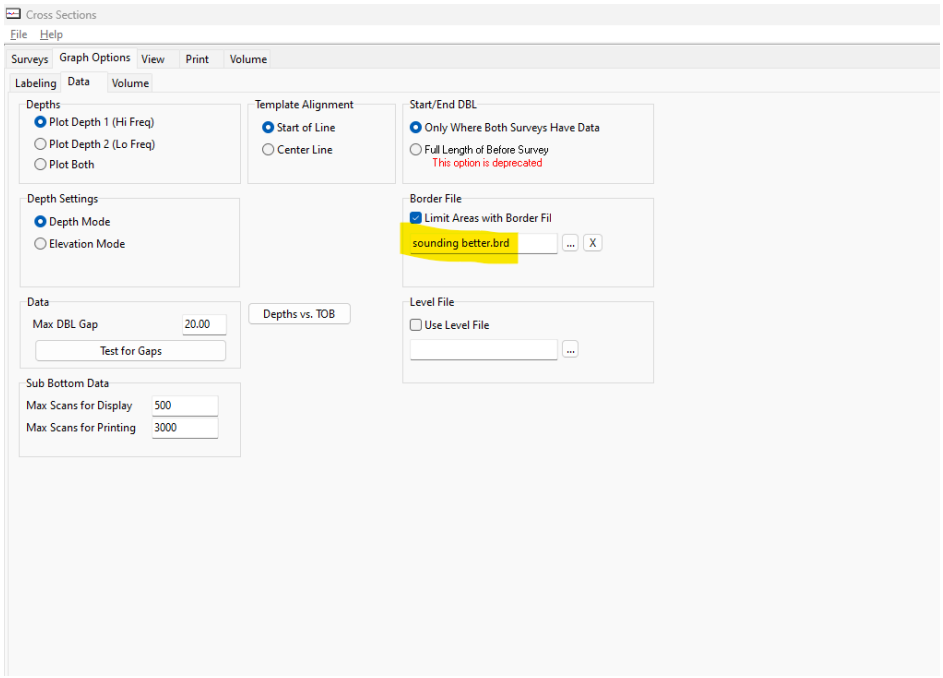
The next step will be to create a border around the tracklines for your dredge using the Border Editor. Simply open border editor (Preparation -> Editors -> Border Editor) and use the mouse to click around your trackline to define the border, and save it for later.



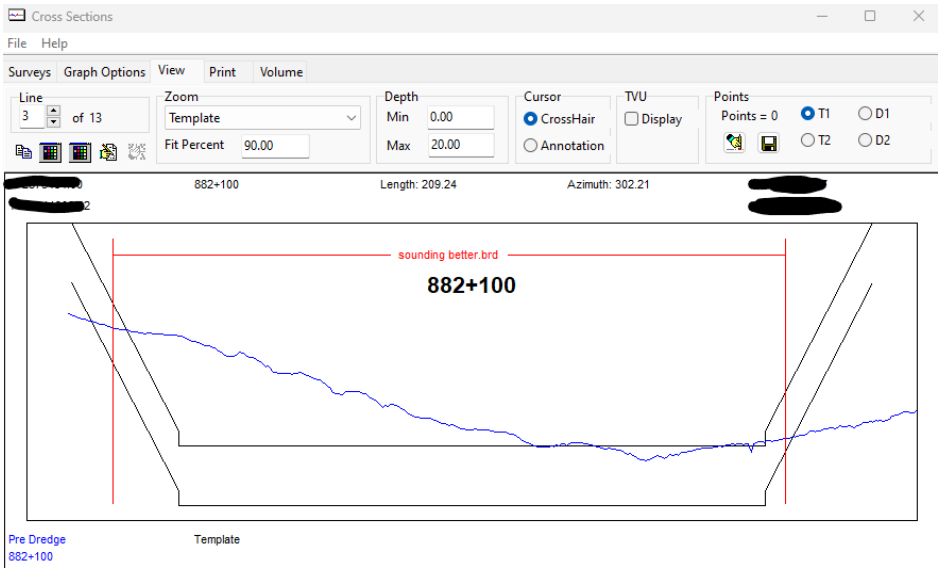
Next, I am going to open the Cross Sections and Volumes program (Final Products -> Cross Sections and Volumes) and load in my pre-dredging survey. Then I'll choose a volume calculation method (I like Philadelphia Pre-dredge or Philadelphia Post-dredge), and then add whatever overdepth the project has (I'm going up to 4 ft just for fun). If you have a post-dredge survey, you can add it here as well. For now, I'm going to leave it out.



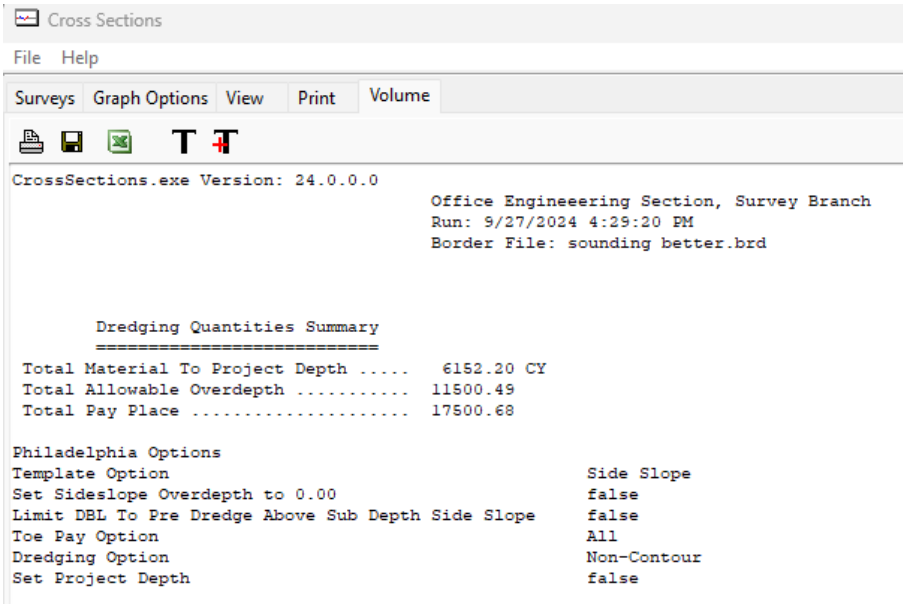
The next step will be to load in the border I created previously. To do this, navigate to the Graph Options tab, then the Data tab. There is an option in this window to load a border file. I'm going to load my file and make sure the Limit Areas with Border File is checked.



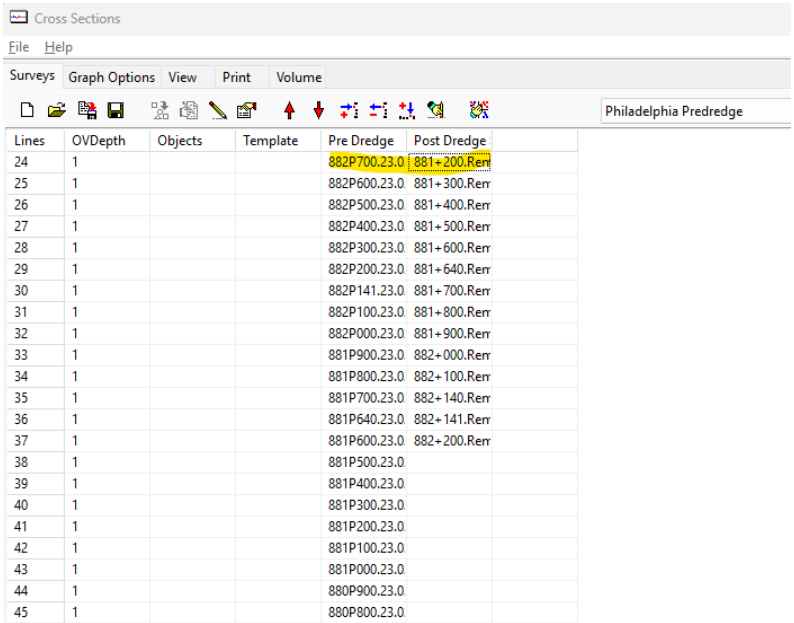
Now I can go over to the View tab and scroll through the surveys until I see my border.



It's a good idea to quickly view all your cross sections that have a border just to make sure everything looks ok. Then, I will go over to the Volume tab. The volume calculated will strictly be calculated from volume inside the border. Total Pay Place is the entire amount of material I have available up to my overdepth.

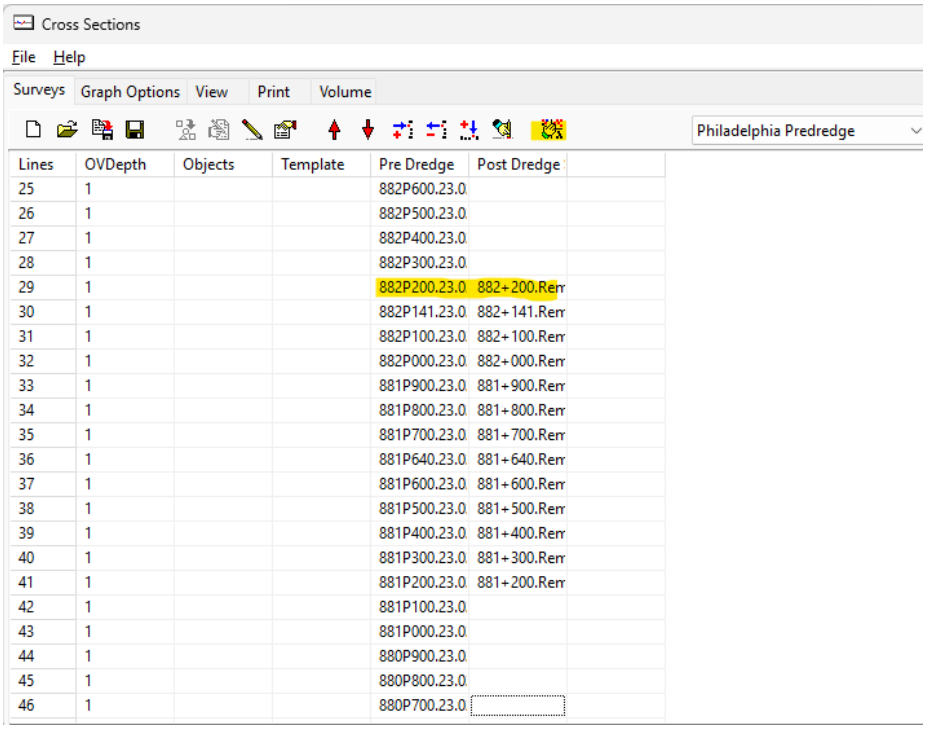


Here I can see that there are 17,500 cubic yards (cy) within my border. If I haven't performed a post-dredging survey of this area, I can get a good estimate on how much I think the dredge removed. For example, if I don't think we completely cleared the template and maybe removed 90% of what was available, I will take that percentage of the total to get my best estimate. If I do have a post-dredge survey, I can get an even better estimate and make notes on our dredging process. After loading in your survey, make sure to click Sort Files to make sure you are comparing the same lines from your pre-survey and post-survey. Also, make sure to select a post-dredging volume calculation method. In the following example image, the stations are not lining up:



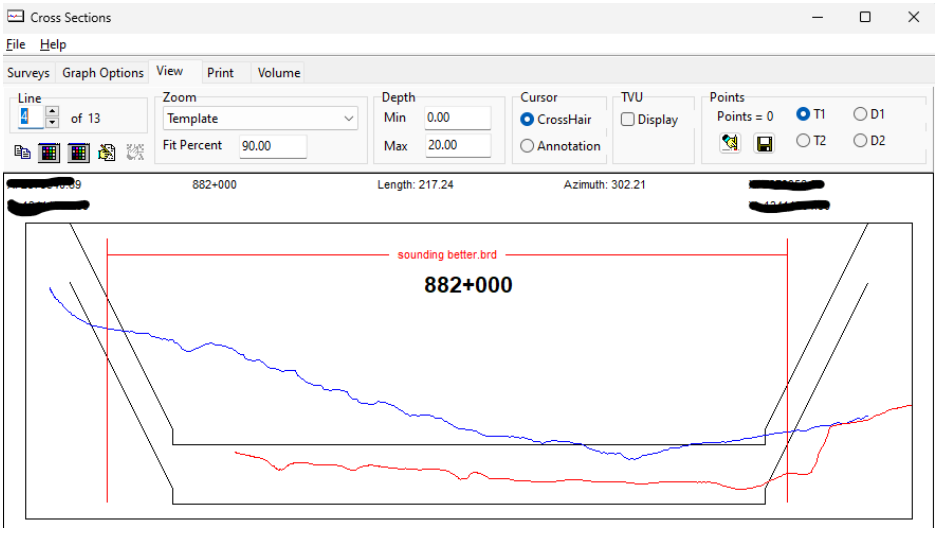
Lines	OVDepth	Objects	Template	Pre Dredge	Post Dredge
24	1			882P700.23.0	881+200.Rem
25	1			882P600.23.0	881+300.Rem
26	1			882P500.23.0	881+400.Rem
27	1			882P400.23.0	881+500.Rem
28	1			882P300.23.0	881+600.Rem
29	1			882P200.23.0	881+640.Rem
30	1			882P141.23.0	881+700.Rem
31	1			882P100.23.0	881+800.Rem
32	1			882P000.23.0	881+900.Rem
33	1			881P900.23.0	882+000.Rem
34	1			881P800.23.0	882+100.Rem
35	1			881P700.23.0	882+140.Rem
36	1			881P640.23.0	882+141.Rem
37	1			881P600.23.0	882+200.Rem
38	1			881P500.23.0	
39	1			881P400.23.0	
40	1			881P300.23.0	
41	1			881P200.23.0	
42	1			881P100.23.0	
43	1			881P000.23.0	
44	1			880P900.23.0	
45	1			880P800.23.0	

The stations line up after clicking Sort Files:



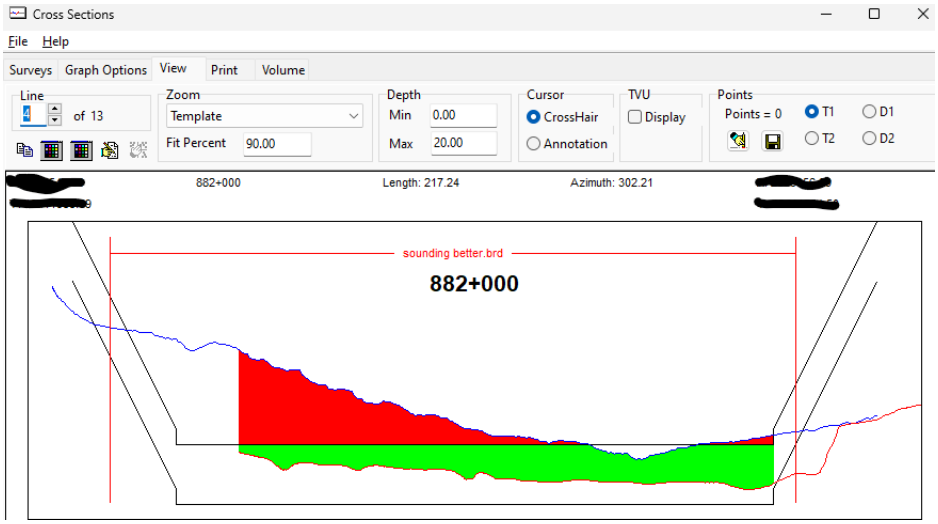
Lines	OVDepth	Objects	Template	Pre Dredge	Post Dredge
25	1			882P600.23.0	
26	1			882P500.23.0	
27	1			882P400.23.0	
28	1			882P300.23.0	
29	1			882P200.23.0	882+200.Rem
30	1			882P141.23.0	882+141.Rem
31	1			882P100.23.0	882+100.Rem
32	1			882P000.23.0	882+000.Rem
33	1			881P900.23.0	881+900.Rem
34	1			881P800.23.0	881+800.Rem
35	1			881P700.23.0	881+700.Rem
36	1			881P640.23.0	881+640.Rem
37	1			881P600.23.0	881+600.Rem
38	1			881P500.23.0	881+500.Rem
39	1			881P400.23.0	881+400.Rem
40	1			881P300.23.0	881+300.Rem
41	1			881P200.23.0	881+200.Rem
42	1			881P100.23.0	
43	1			881P000.23.0	
44	1			880P900.23.0	
45	1			880P800.23.0	
46	1			880P700.23.0	

Here I am using the Philadelphia Post-dredge calculation. After all of this is set how I want it, I will quickly scroll through my surveys again to make sure everything looks good.

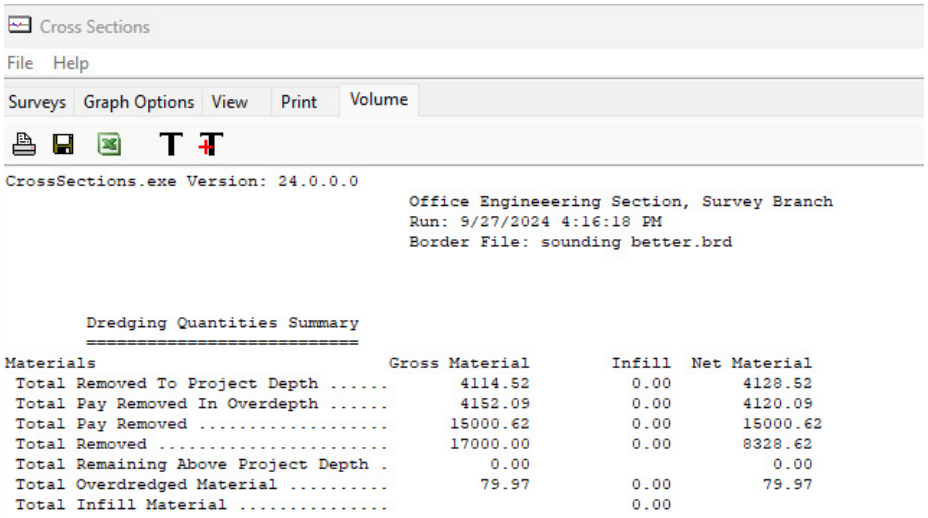


One think to keep in mind with this example, volume will only be calculated where both surveys have data. This may make it seem like I dredged less than the actual number, especially since we are averaging this gap over 100 ft. Turning the colors on, I can easily see there will be a large chunk of this survey not included in the final volume. I can either go out

and rerun the survey or just keep this bit of information in mind before deciding on a final number.



I'm not too worried about it at this point, so I'll go on over to the Volume tab and check the numbers.



The number I'm after here is the Total Pay Removed. This is my total dredged material dug to my overdepth. Anything dug beneath the overdepth is not included in the Total Pay calculation. This will be included in the Total Removed however, if you are interested in that number. I can see here that my total pay removed is 15,000 cy. Remember though, some portion of the material that likely has been removed is not included in my post-dredge survey, so my actual pay volume removed is likely a little higher than what we are actually seeing.