VISION ZER☼

zero deaths
zero serious injuries

Memorandum

To: e-distribution
            See below

From: Lesly Tribelhorn, P.E.
            Highways Engineer

Date: November 15, 2017

Subject: <u>Wetlands Delineated Boundary and Buffer Coordinates to Contract Plans</u>

Delineated wetland boundaries and buffer coordinates will be provided to Contract Plans for posting with advertised project bid files. This will help avoid impacts that aren't permitted by MDT. Contractor and MDT field construction crews can more effectively stake un-permitted, delineated wetlands for avoidance or acquiring additional permits as necessary.

The intent is to provide survey coordinates in electronic, comma delineated .txt files that can be directly downloaded into the survey data collectors.

Two distinct sets of files will be generated. Each file and/or the coordinates should be labeled to correspond with the appropriate wetland as they are shown in the plans. One set of files will reflect the coordinates of the shapes provided by the District Biologists. The other sets of files will reflect a "buffer" from each wetland. The "buffer" is intended to provide fewer points for staking. Buffer coordinates will be provided for the delineated wetland boundaries that are between the construction limits and right-of-way or construction easement.

The District Biologists will verify the files submitted to Design reflect the project survey datum by contacting the Land Survey Manager or a Survey Project Manager. New strip maps submitted to the Designer from the District Biologists should be generated from a 3D seed file in the same workspace matching the design delivery files.

Designers should use the procedures described in the attached processes for creating the .txt files. Be certain to provide the relative disclaimer verbiage, as shown in the process documents, to each buffer and delineated boundary file. The Open Roads or Geopak process should be completed after final construction limits have been established and permitted areas are well defined. The final comma delineated .txt files should be submitted to Contract Plans with the final PS&E submittal. Checkers will notify Contract Plans that the .txt files should be posted with the advertised bid package for information only.

This process is effective immediately for all appropriate projects that are at or before Final Plan Review. Coordinates can be provided to construction upon request for projects beyond Final Plan Review. Please contact Jim Combs (jcombs@mt.gov) for questions regarding this guidance.

Attachments
        Geopak Wetland Delineation and Buffer Process
   OpenRoads Wetland Delineation Process

Electronic distribution:

Dustin Rouse, Preconstruction Engineer
Kevin Christensen, Construction Engineer
Lesly Tribelhorn, Highways Engineer
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Kent Barnes, Bridge Engineer
Matt Strizich, Materials Engineer
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Suzy Price, Contract Plans Bureau Chief
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Shane Stack, Missoula District Preconstruction Engineer
Steve Prinzing, Great Falls District Preconstruction Engineer
John Cornell, Road Plans Checker
Jerry Sabol, Road Plans Checker
Tom Martin, Environmental Services Bureau Chief
Bill Semmens, Environmental Resources Section Supervisor
Tom Gocksch, Environmental Engineering Section Supervisor

Geopak Wetland Delineation and Buffer Process

A. Generating x, y coordinates for the delineated wetlands

1. Download a local copy of the file xxxxxxxenwsu001.dgn and make sure to identify the names of all the wetlands. (Changes made to this file are temporary for the purposes this process.)

2. Open the local xxxxenwsu001.dgn file. Drop status on the wetland boundary (level = E_Natural_Wetland_Boundary). The line code may need to be changed if a custom line style is used. Consider setting the line code equal to 0.

3. Create a gpk called jobwxx.gpk. There are multiple points in each wetland. Creating a separate gpk will ensure you are not over-writing any points needed in the Road Design gpk. Turn off the levels "E_Natural_Wetland_Area" and "E_Natural_Ordinary_HighWater_Mark". All that will be shown is the boundary on level "E_Natural_Wetland_Boundary".

4. Select **store graphics**, input the wetland name selected by Environmental (e.g. WL01A, WL01B, WL02, etc.) and store the graphics into the gpk (see figure 1). Create a log of the points by saving the IOC (Input Operator Code). Complete this individually for each wetland from the appropriate TIN file. (Note: If the environmental strip map was constructed in a 3D seed file and a 3D element, x, y and z(elevation) coordinates are assigned for the wetland boundary coordinates. If the environmental strip map seed file is 2D, this process assigns x and y coordinates. Z coordinates (elevations) will need to be derived from the correct TIN file(s).)
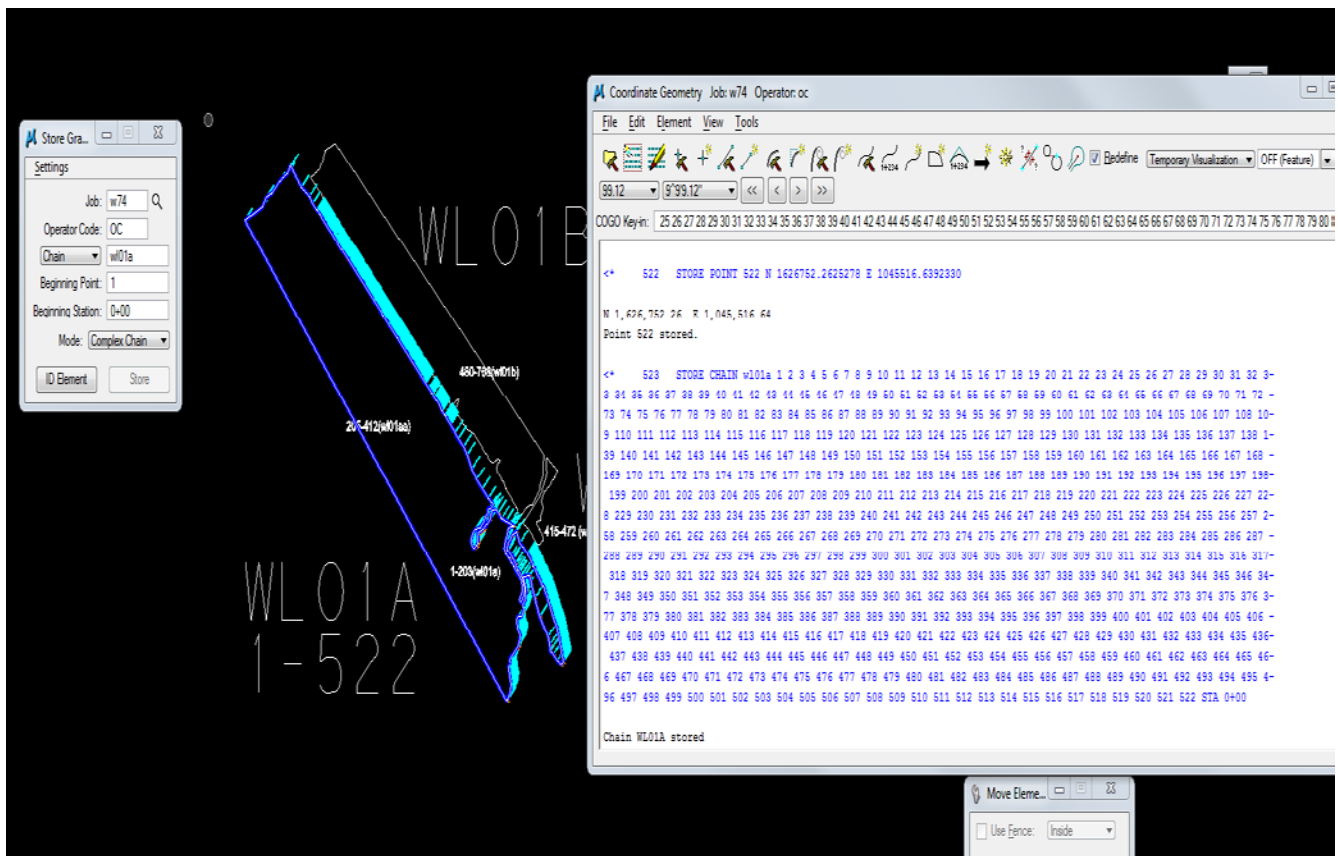
B. Generating Buffer x and y coordinates

Buffer coordinates are intended to provide a means to stake selective points near, but outside, unpermitted wetland boundaries within MDT right-of-way or easement.

1. Go into your Road Design strip map. Select a line a minimum of 3' beyond our wetland impact and place a line on level "P_Wetland_Site_const_limits", that creates a buffer area between the Construction limits, and the design right-of-way. Consider adding breaks where the boundary is offset from the delineated boundary by at least approximately 15' continuously for at least 50'.
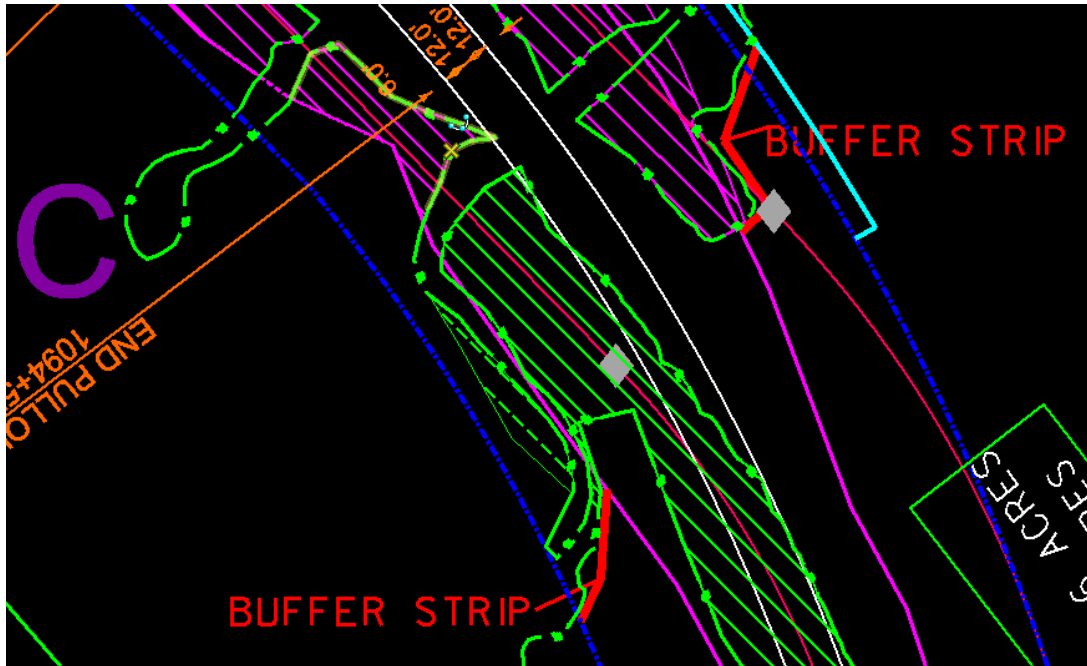

2. From Geopak, select **store graphics**, name the buffer line such that it is relative to the corresponding Environmental name and designates a buffer line (e.g. WB01A) and store the graphics into the gpk on the "level P_Wetland_Site_const_limits". Create a log of the points by saving the IOC (Input Operator Code). Complete this individually for each buffer line. (Note: There may be multiple buffer lines for each wetland. Complete this process for each line and name each line relative to its associated wetland (e.g. WB01A1, WB01A2, WB01A3, etc.))

C. Assigning z coordinate elevations to the points

Elevations need to be assigned to the delineated wetlands and the buffer coordinates. If the environmental strip map was constructed in a 3D seed file and has 3D elements, elevations are already assigned to the delineated wetlands coordinates. Step C is necessary for all buffer points and all delineated wetland points derived from a 2D Environmental strip map.

1. From Geopak, select **Applications/Survey/Project/New/**your gpk file created in Step A.3. with all the wetland info.

2. Select **Geometry/Points/set elevations from TIN**. Complete the step for each TIN file.
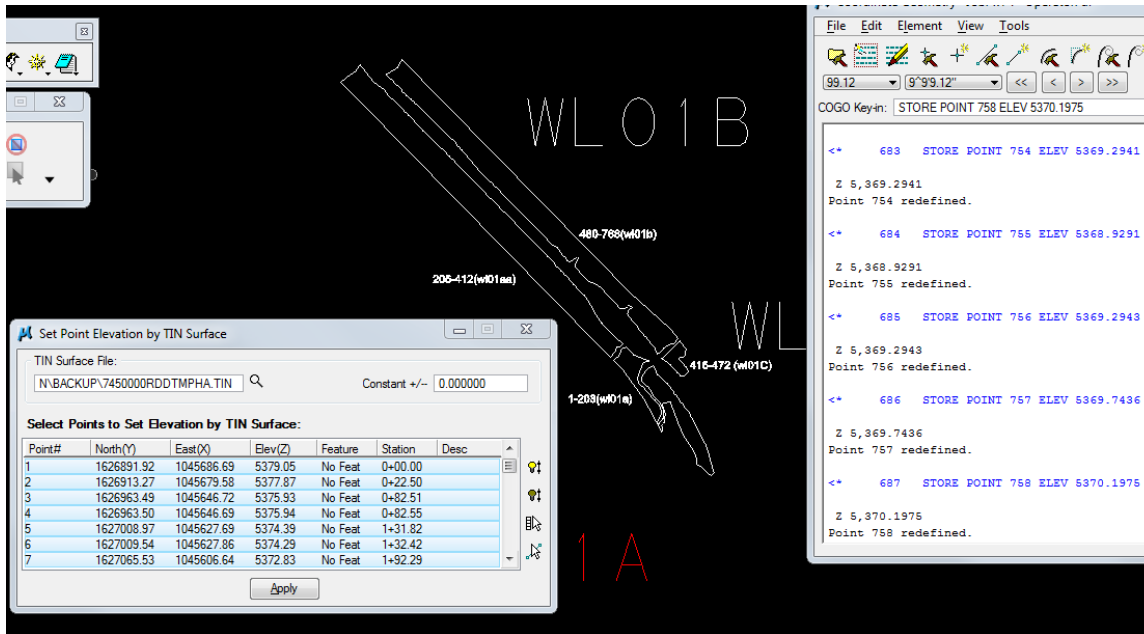
D. Create comma delineated txt files
  1. From Coordinate Geometry select **File/Export/Ascii points**. Select **Point #, North(Y), East(X) and Elev(Z)** for the Output format. Select **None** for the remaining output format. Name the file relative to the appropriate wetland and if the file points are buffer or delineated wetland points. Use WSU (e.g. 7450000rdwsu01a.txt) for the delineated wetland files. Use WBF (e.g. 7450000rdwbf01a.txt) for the buffer files. Select the point numbers for the file. Select **Apply**. Repeat this process separately for each delineated wetland boundary and buffer to create individual buffer and boundary txt files for each wetland. (Note: It is important to select the correct points for each file. This is why the point logs created in steps A4 and B2 are important.)
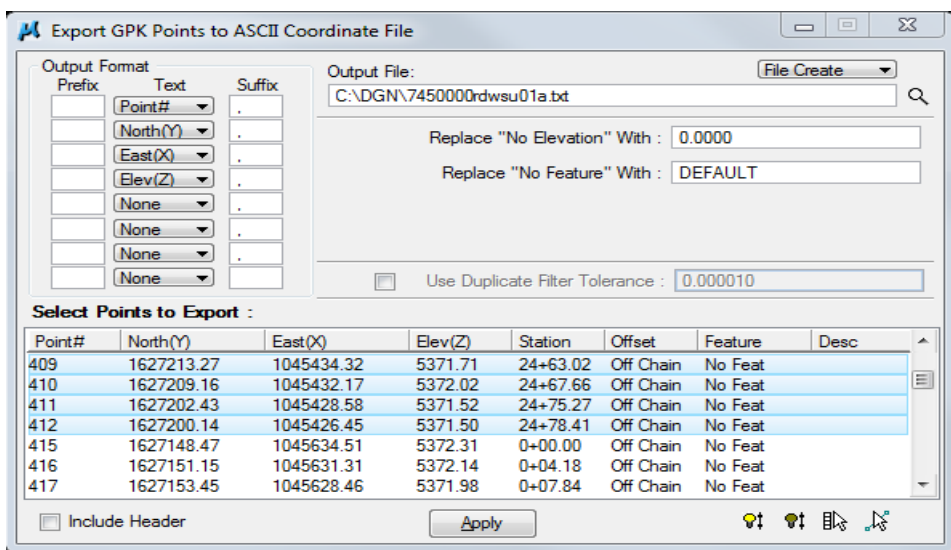
2. Fill in the project name on the appropriate disclaimer statement below and copy the disclaimer below the last row of data in each txt file.:

   i. **Delineated wetlands coordinate files**– "These coordinates are intended to reflect the delineated wetlands boundary for project XXXXX. It is the contractor's responsibility to verify these coordinates with the plans and permit(s). If you have questions on these wetlands boundary coordinates, contact the appropriate MDT District Biologist. These coordinates correspond to the wetlands on the contract plans. Any action impacting un-permitted wetlands areas inside or outside the MDT right-of-way and construction permits without the proper permitting is the responsibility of the contractor. "

   ii. **Buffer coordinate files** – "These coordinates are intended to provide an approximate, easy check of the un-permitted, wetland areas for project XXXX. It is the contractor's responsibility to verify these coordinates with the plans and permit(s). If you have questions on these un-permitted wetlands boundary coordinates contact the appropriate MDT District Biologist. Buffer coordinates are only provided for un-permitted areas within the project limits between MDT right-of-way or easement and construction limits. Any action impacting un-permitted wetlands areas inside or outside the MDT right-of-way and construction permits without the proper permitting is the responsibility of the contractor. "

E. Submit the files to Contract Plans with Contract Plans form 745. Note to contract plans that the files are not part of the contract. The files are to be posted with the advertised bid "for information only".

OpenRoads Wetland Delineation Process

1. Download a view copy of the wetland survey (ENWSU) and right-of-way map (ROMAP) files.

2. Reference ENSWU, ROMAP and any corridor (CRR) files into your alignment (ALN) drawing file. Turn off all levels in the ENWSU except the wetland boundaries. Turn off all the levels in the ROMAP file except for new right-of-way, existing right-of-way and construction permits.

3. Merge ENWSU reference into your ALN file.
   - Reference> Tools> Merge into Master

4. Create a horizontal alignment for each wetland. Use feature definition: Wetland Existing Boundary. Name the alignment based on Environmental's designation.
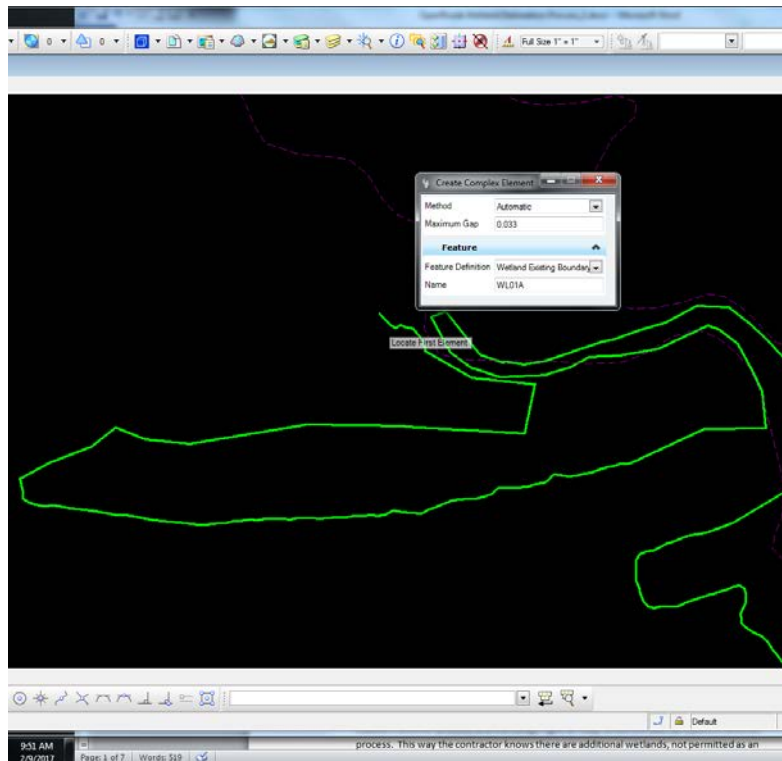
CREATE ALGINMENT

5. Offset wetland boundary 3'.

6. Place best-fit line segments to create a simple buffer area between the Construction limits and the design right-of-way (or construction permit). The buffer must be a minimum of 3' outside the delineated wetland boundary. This way the contractor knows there are additional wetlands, not permitted as an impact, inside our right-of-way. Construction limits and design right-of-way/construction permits will be staked in another process. **Consider adding breaks where the**

boundary is offset from the delineated boundary by at least approximately 15' continuously for at least 50'.
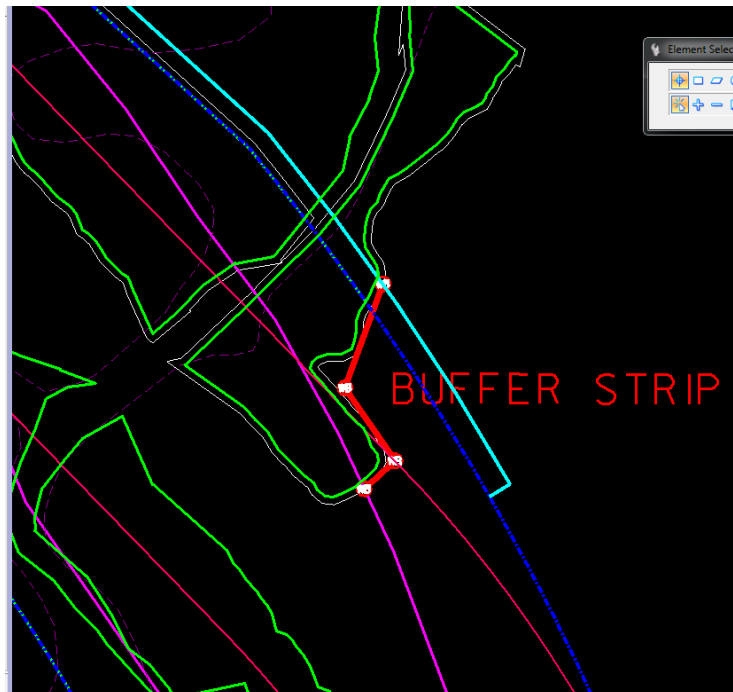
WETLAND BUFFER BETWEEN CONST LIMIT & R/W

7. Create a horizontal alignment for each buffer strip. Use feature definition <u>Wetland Impact Boundary</u>. Name the alignments based on the wetland delineation.
EX: Wetland 01C, Buffer WB01C_1

8. Create a vertical profile for each alignment from the existing ground terrain. (You can do this for multiple alignments at a time).
    a. Use the <u>Profile from Surface</u> tool.
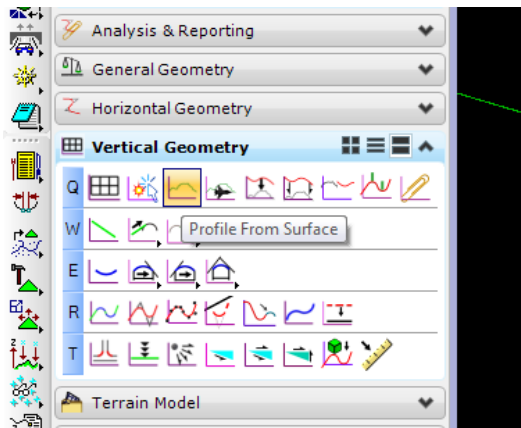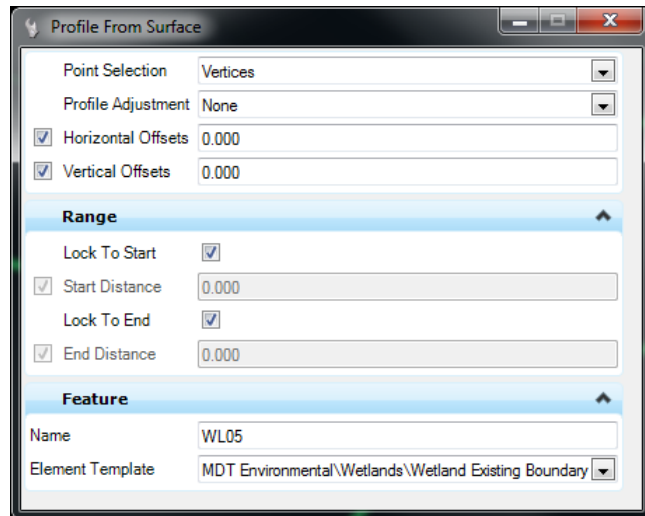
b. Choose the existing terrain as the reference surface.

9. Open the horizontal geometry report for the alignment. (Steps 9 through 20 will be repeated individually for each wetland and buffer alignment).

10. Choose HorizontalElementsXYZ.xsl
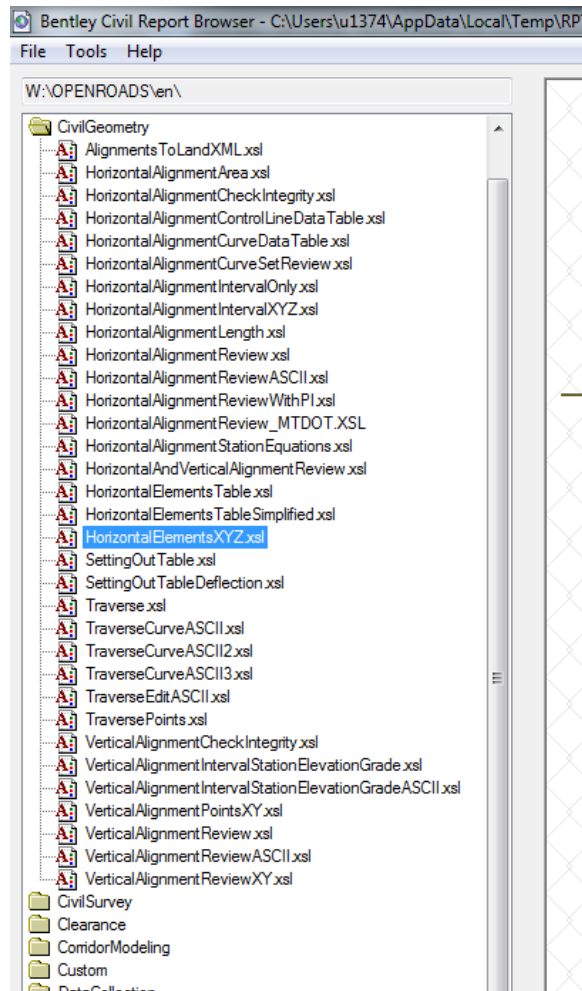
11. Save the report using Save As (xxxxxxxRDWSU005 for wetlands and xxxxxxxRDWBF005 for buffers) 01A, 1AA, 01B, etc.
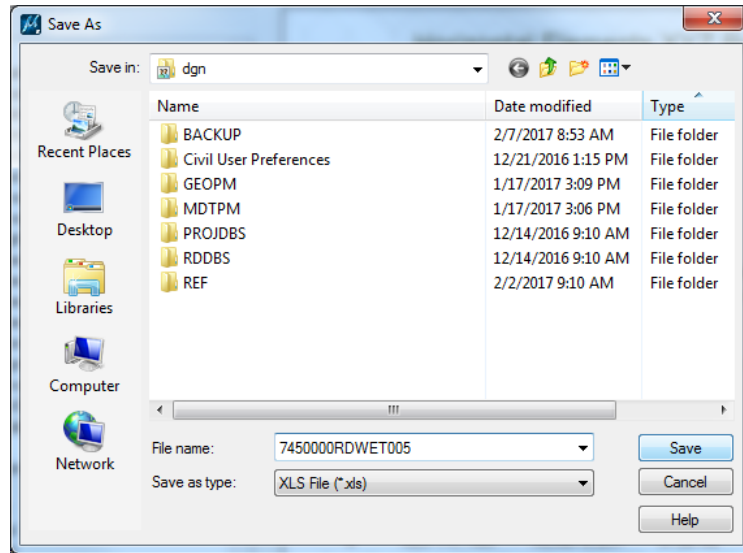
12. Open the file in Microsoft Excel

If you get this message, click yes.
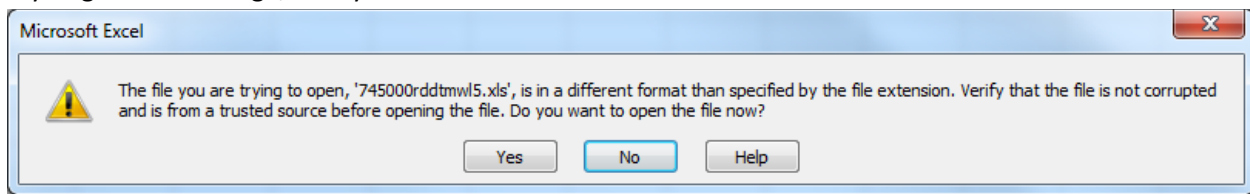
13. Under the File tab, click Convert (This will change the file from an *.xls to an *.xlsx and save it under the same name)

14. Select all data (Ctrl-A) and unselect Merge and Center

15. Delete Rows 1-14 and Columns E, F, and G

| File | Home | Insert | Page Layout | Formulas | Data | Review | View | Add-Ins |

Arial | 16 | A⁺ A⁻ | Wrap Text | General | Conditional Formatting ▾ Format as Table ▾ Cell Styles ▾ | Insert Delete Format | Σ AutoSum ▾ Fill ▾ Clear ▾ | Sort & Filter ▾ Find & Select ▾

Paste | Cut | Copy ▾ | Format Painter | B I U ▾ | ▾ | ◇ ▾ A ▾ | Merge & Center ▾ | $ ▾ % , | ⁺.⁰ .⁰⁰

Clipboard | Font | Alignment | Number | Styles | Cells | Editing

A1 | fx | Horizontal Elements XYZ Report

|	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1		Horizontal Elements XYZ Report													
2															
3		Report Created: 2/7/2017													
4		Time: 6:41am													
5															
6	Project:	Default													
7	Description:														
8	File Name:	C:\dgn\7450000RDALN001.DGN													
9	Last Revised:	2/7/2017 6:41													
10		Note: All units in this report are in feet unless specified otherwise.													
11															
12															
13		Alignment Name: WL05													
14	Point	Easting (X)	Northing (Y)	Elevation	Station	Direction	Radius								
15	1	1037112.899	1639271.029	5790.36	0+00.00	N 42°48'29" E									
16	2	1037114.535	1639272.796	5790.34	0+02.41	N 42°48'29" E									
17	3	1037114.535	1639272.796	5790.34	0+02.41	N 37°34'13" E									
18	4	1037117.183	1639276.237	5790.48	0+06.75	N 37°34'13" E									
19	5	1037117.183	1639276.237	5790.48	0+06.75	N 36°17'21" E									
20	6	1037119.988	1639280.058	5790.55	0+11.49	N 36°17'21" E									
21	7	1037119.988	1639280.058	5790.55	0+11.49	N 37°11'39" E									
22	8	1037122.608	1639283.51	5790.59	0+15.82	N 37°11'39" E									
23	9	1037122.608	1639283.51	5790.59	0+15.82	N 33°43'58" E									
24	10	1037124.857	1639286.878	5790.7	0+19.87	N 33°43'58" E									
25	11	1037124.857	1639286.878	5790.7	0+19.87	N 32°34'20" E									
26	12	1037127.384	1639290.834	5790.68	0+24.57	N 32°34'20" E									
27	13	1037127.384	1639290.834	5790.68	0+24.57	N 41°56'50" E									
28	14	1037130.018	1639293.765	5790.83	0+28.51	N 41°56'50" E									
29	15	1037130.018	1639293.765	5790.83	0+28.51	N 32°29'42" E									
30	16	1037132.48	1639297.63	5790.85	0+33.09	N 32°29'42" E									
31	17	1037132.48	1639297.63	5790.85	0+33.09	N 40°36'54" E									
32	18	1037134.966	1639300.529	5790.87	0+36.91	N 40°36'54" E									
33	19	1037134.966	1639300.529	5790.87	0+36.91	N 40°54'06" E									
34	20	1037137.399	1639303.337	5790.91	0+40.63	N 40°54'06" E									
35	21	1037137.399	1639303.337	5790.91	0+40.63	N 29°54'34" E									
36	22	1037138.992	1639306.106	5790.94	0+43.82	N 29°54'34" E									
37	23	1037138.992	1639306.106	5790.94	0+43.82	N 23°38'06" E									
38	24	1037148.106	1639326.934	5790.59	0+66.56	N 23°38'06" E									
39	25	1037148.106	1639326.934	5790.59	0+66.56	N 31°00'50" E									
40	26	1037148.885	1639328.23	5790.53	0+68.07	N 31°00'50" E									
41	27	1037148.885	1639328.23	5790.53	0+68.07	N 48°54'39" E									
42	28	1037150.8	1639329.899	5790.82	0+70.61	N 48°54'39" E									
43	29	1037150.8	1639329.899	5790.82	0+70.61	N 36°52'03" E									
44	30	1037152.833	1639332.611	5790.81	0+74.00	N 36°52'03" E									
45	31	1037152.833	1639332.611	5790.81	0+74.00	N 41°06'34" E									
46	32	1037155.248	1639335.377	5790.98	0+77.67	N 41°06'34" E									

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16. Format Columns B and C as 3 decimal place numbers.

17. Format Column D as 2 decimal place numbers.

18. Cut Column C (Ctrl-X) and paste before Column B (right click on Column B and Select Insert Cut Cells). Now the columns are in the correct order: Point Number, Northing, Easting, Elevation.
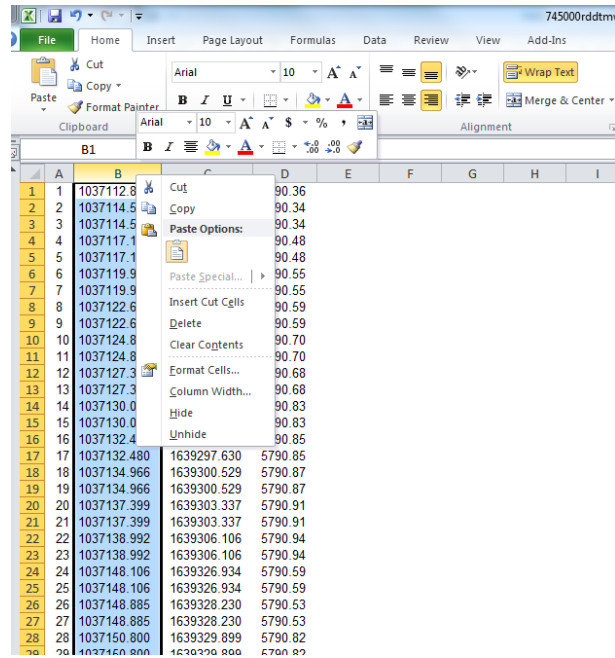
19. Update point numbers to avoid overwriting in the data collector.

20. Fill in the project name for the appropriate disclaimer statement and copy below the last row of data in each csv file:

    1. **Coordinates for the delineated wetlands as shown on the plans**:
       These coordinates are intended to reflect the delineated wetlands boundary for project XXXXX. It is the contractor's responsibility to verify these coordinates with the plans and permit(s). If you have questions on these wetlands boundary coordinates, contact the appropriate MDT District Biologist. These coordinates correspond to the wetlands on the contract plans. Any action impacting un-permitted wetlands areas inside or outside the MDT right-of-way and construction permits without the proper permitting is the responsibility of the contractor.

    2. **Buffer coordinates for un-permitted wetlands within the right-of-way**:
       These coordinates are intended to provide an approximate, easy check of the un-permitted, wetland areas for project XXXX. It is the contractor's responsibility to verify these coordinates with the plans and permit(s). If you have questions on these un-permitted wetlands boundary coordinates contact the appropriate MDT District Biologist. Buffer coordinates are only provided for un-permitted areas within the project limits between MDT right-of-way or easement and construction limits. Any action impacting un-permitted wetlands areas inside or outside the MDT right-of-way and construction permits without the proper permitting is the responsibility of the contractor.

21. Save file as a *.csv (comma delimited)

Create individual *.csv files for each wetland and buffer and name according to Environmental's wetland delineation.