
# Utilities Tab User Guide

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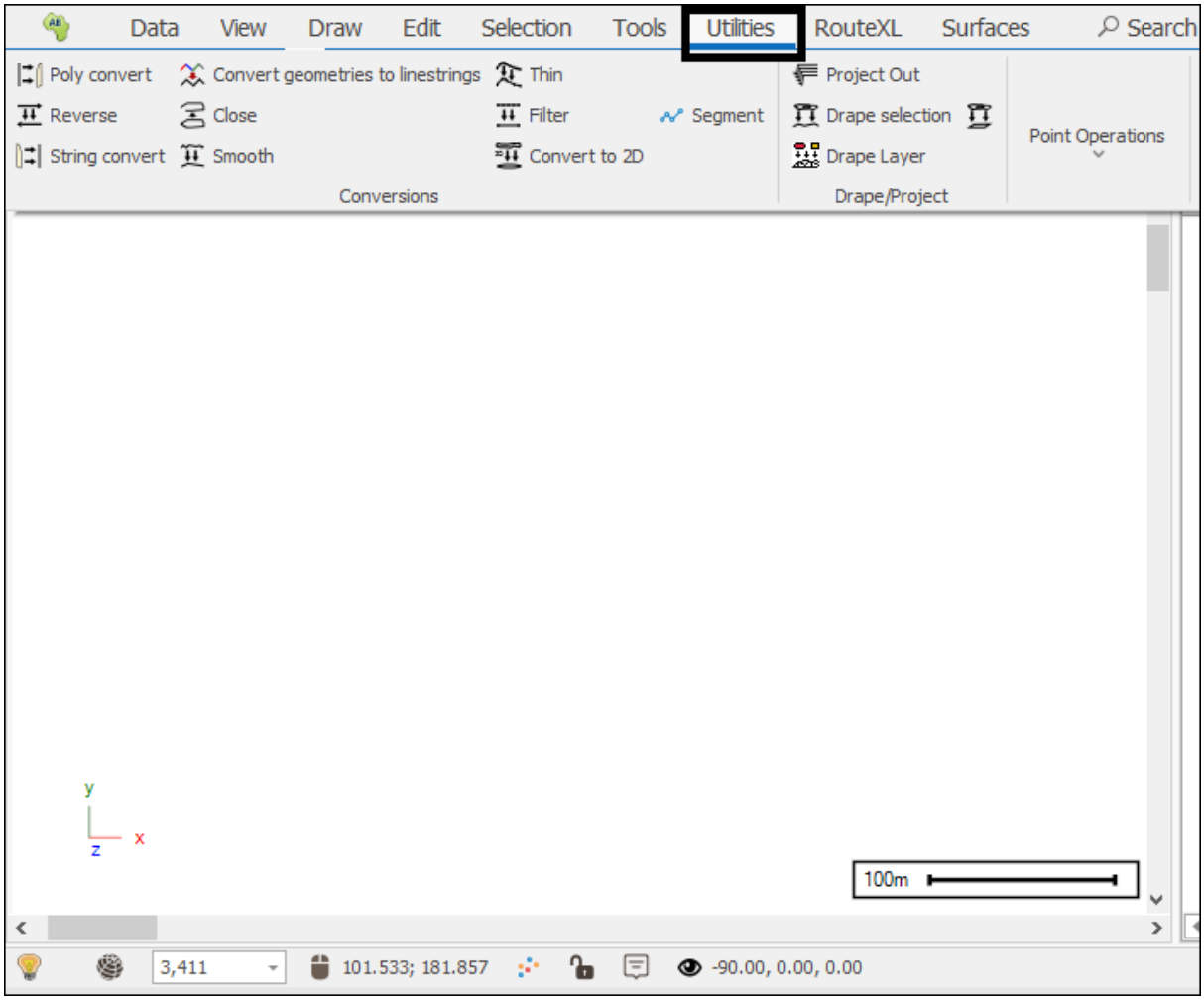
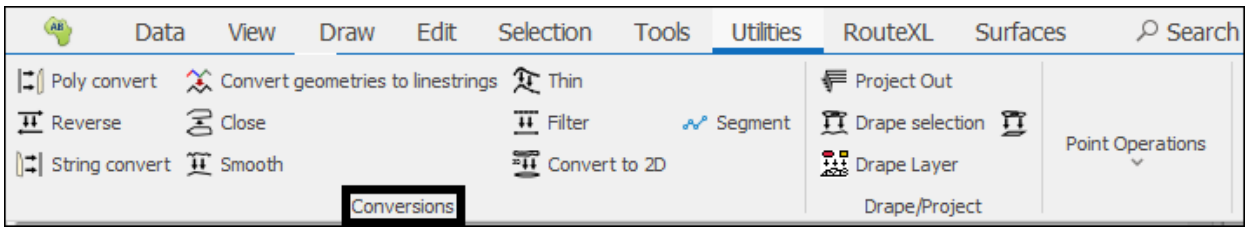
# Intro

This is a manual on all the different tools available in the **Utilities** tab of all our spatial products:

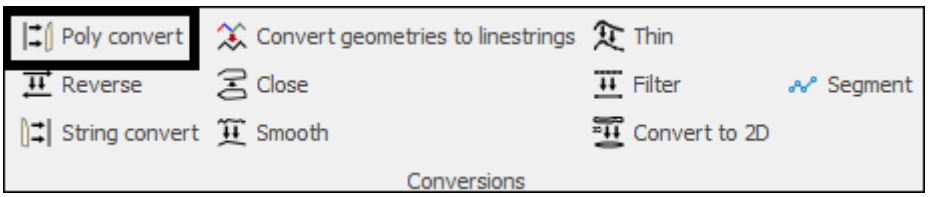



We will start by taking up the **Conversions** section of the tab.

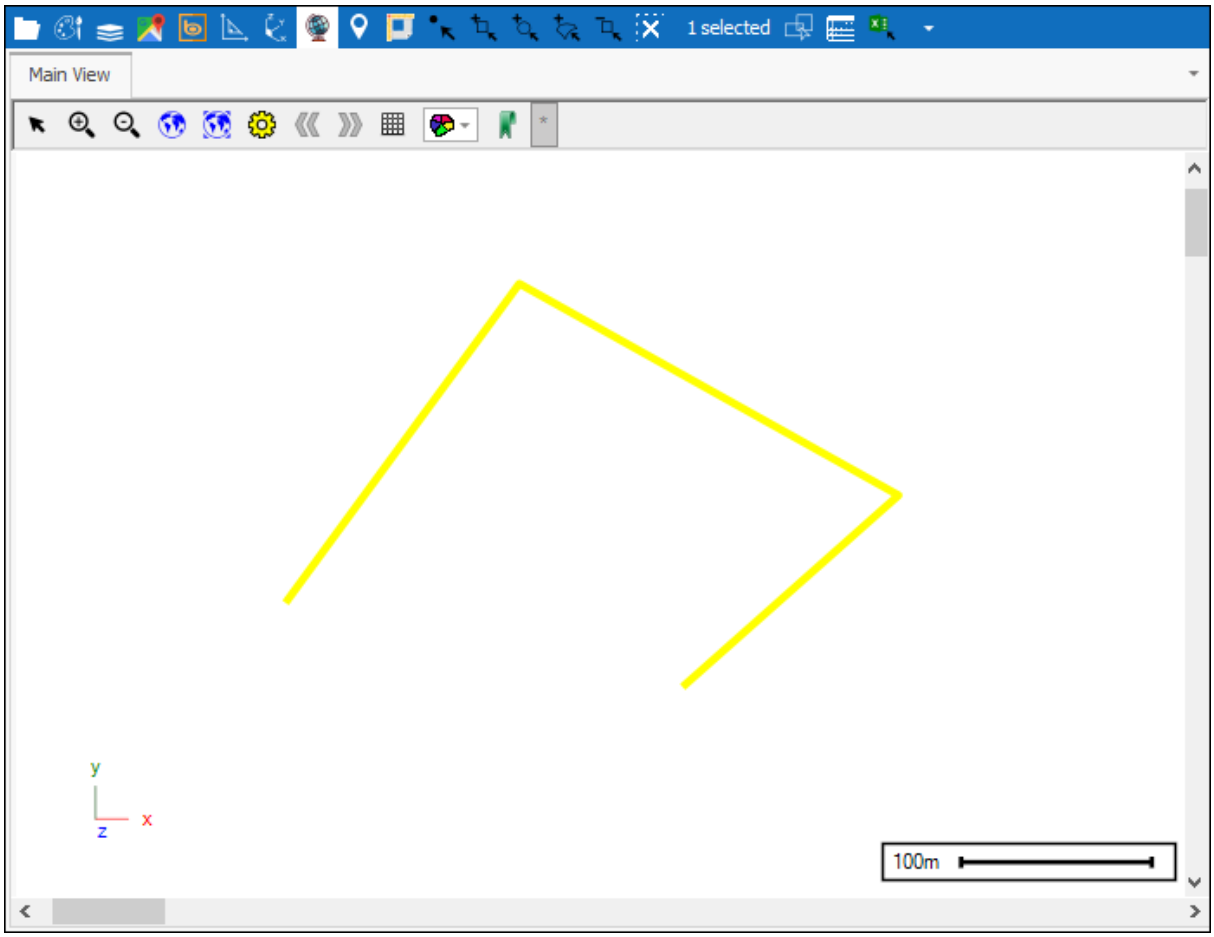
# Conversions



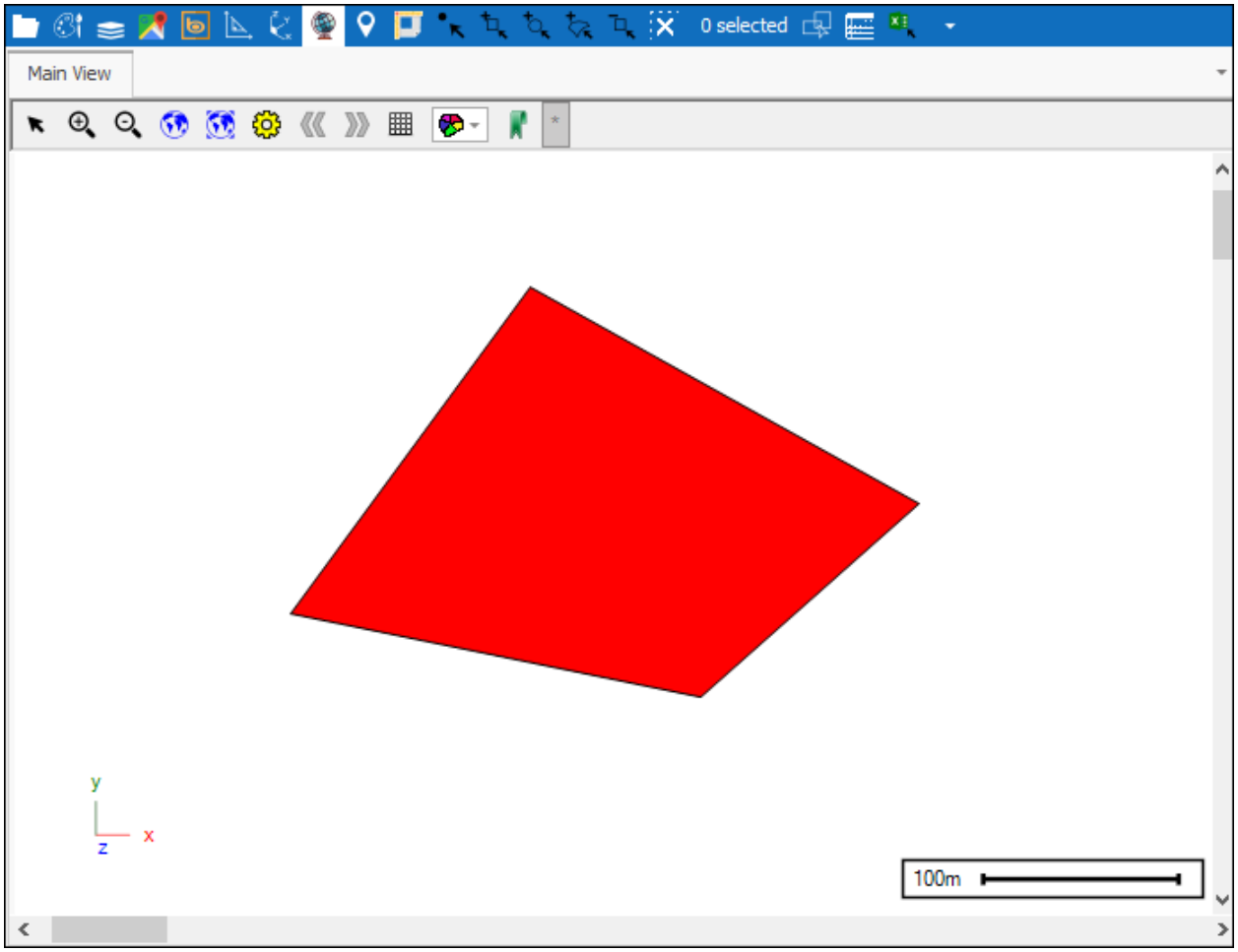
## Poly convert



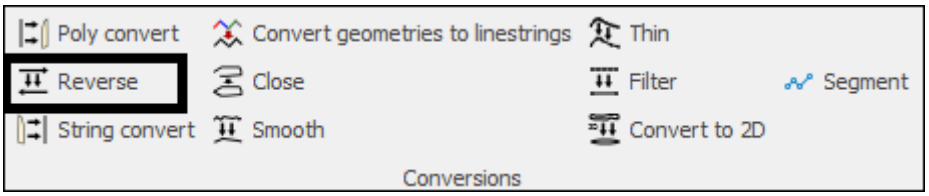

The **Poly convert** tool will convert any linestring into a polygon. First select the linestring:



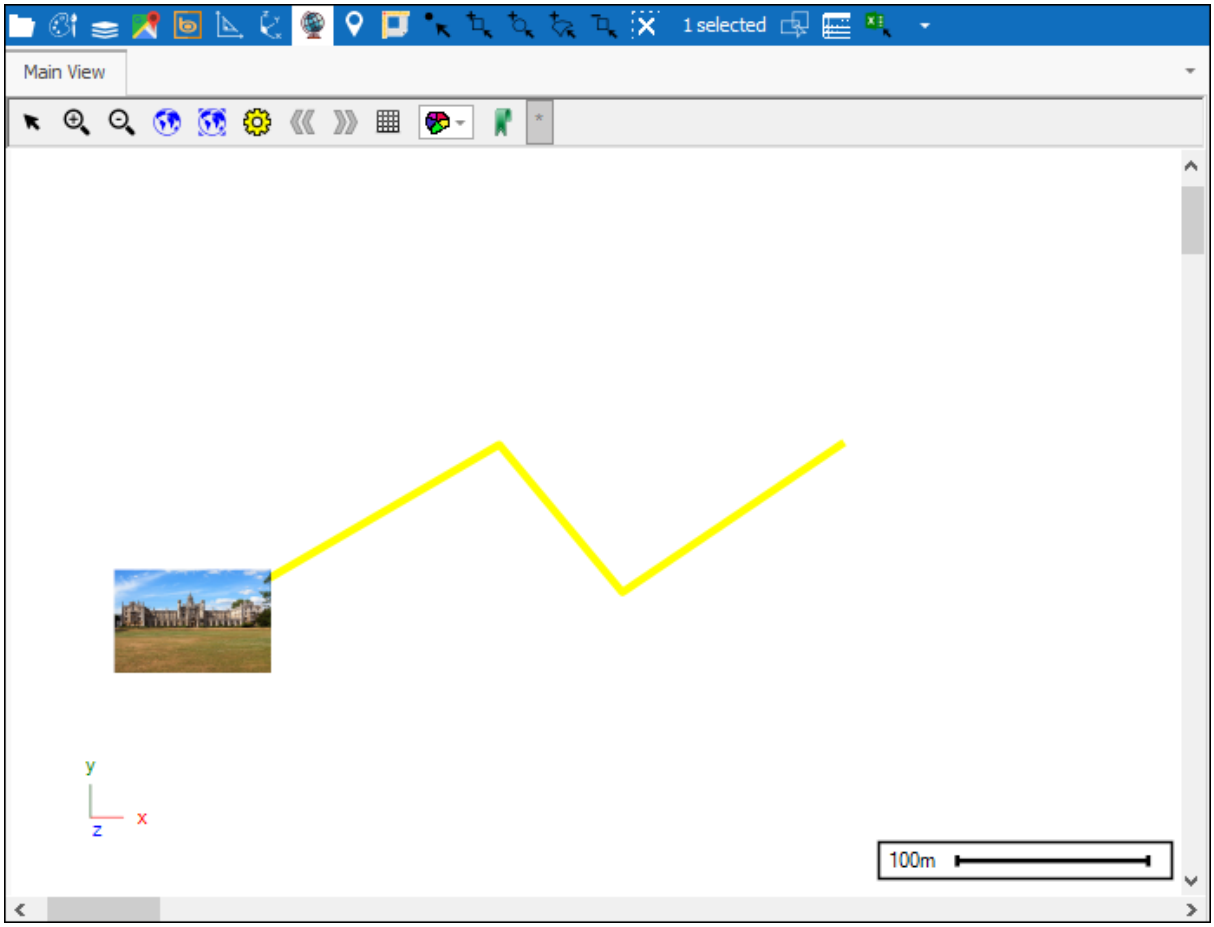

Then click the tool and your linestring has been converted to a polygon:



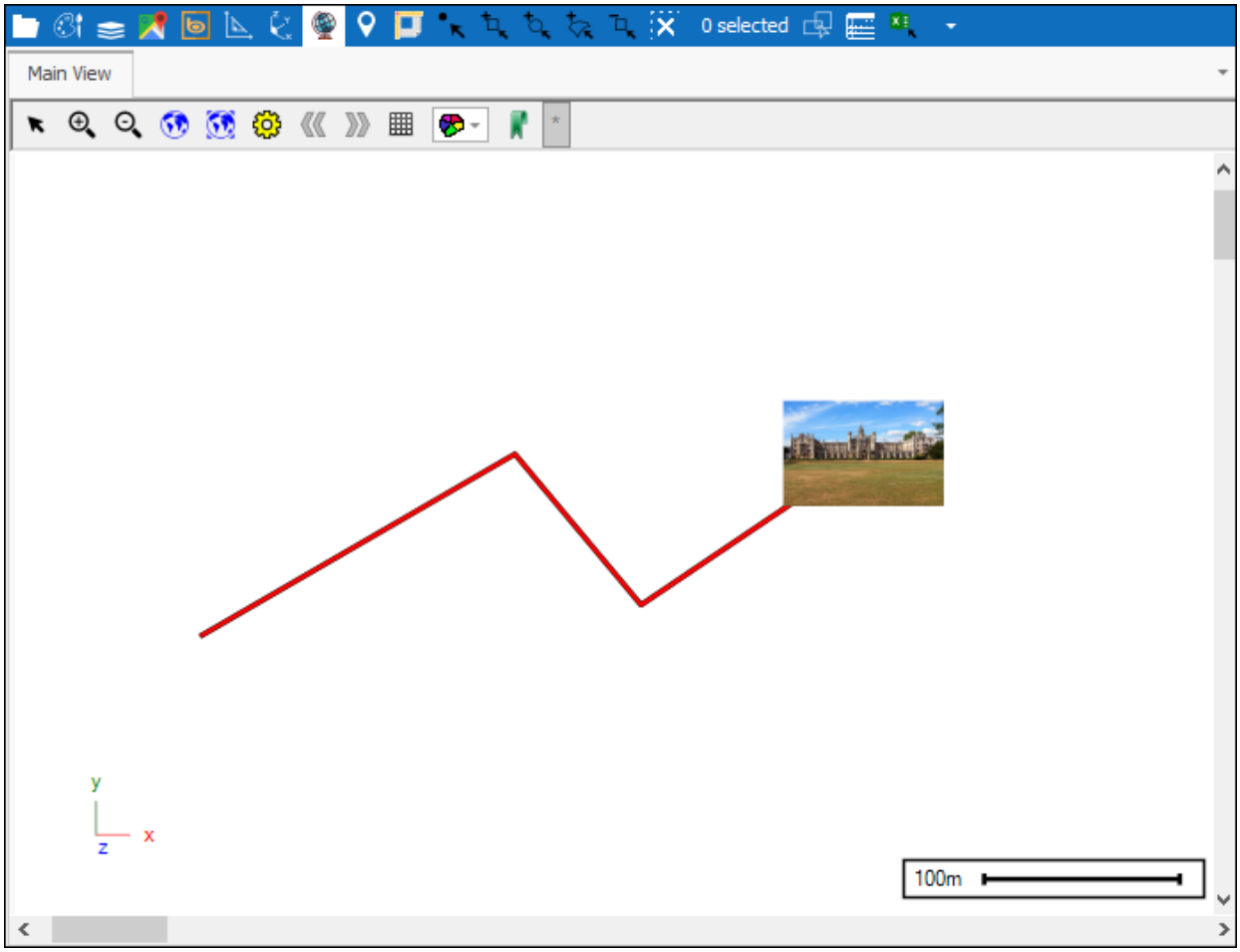

## Reverse



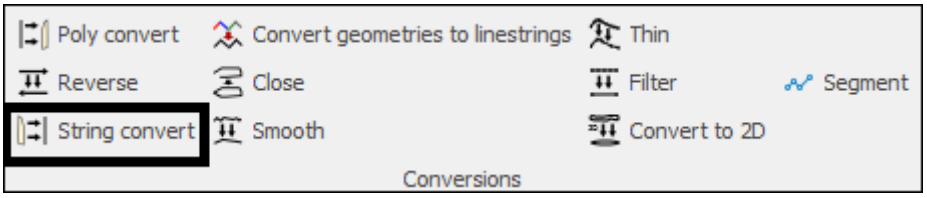

The **Reverse** tool will reverse the direction of selected linestrings. First select the linestring (Note: to illustrate the reversal I have a picture at the start point of the linestring):



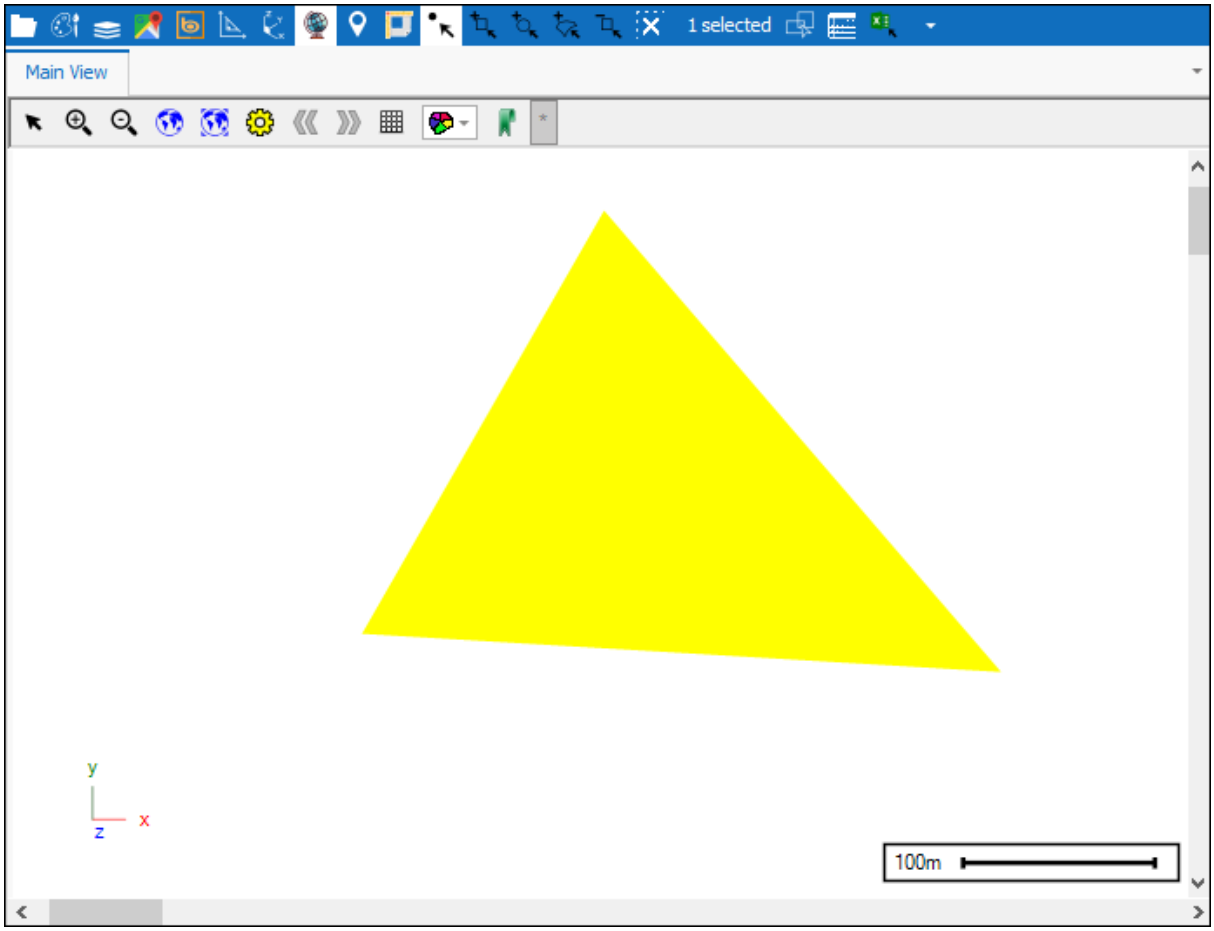

Then click the tool and your linestring has been reversed:



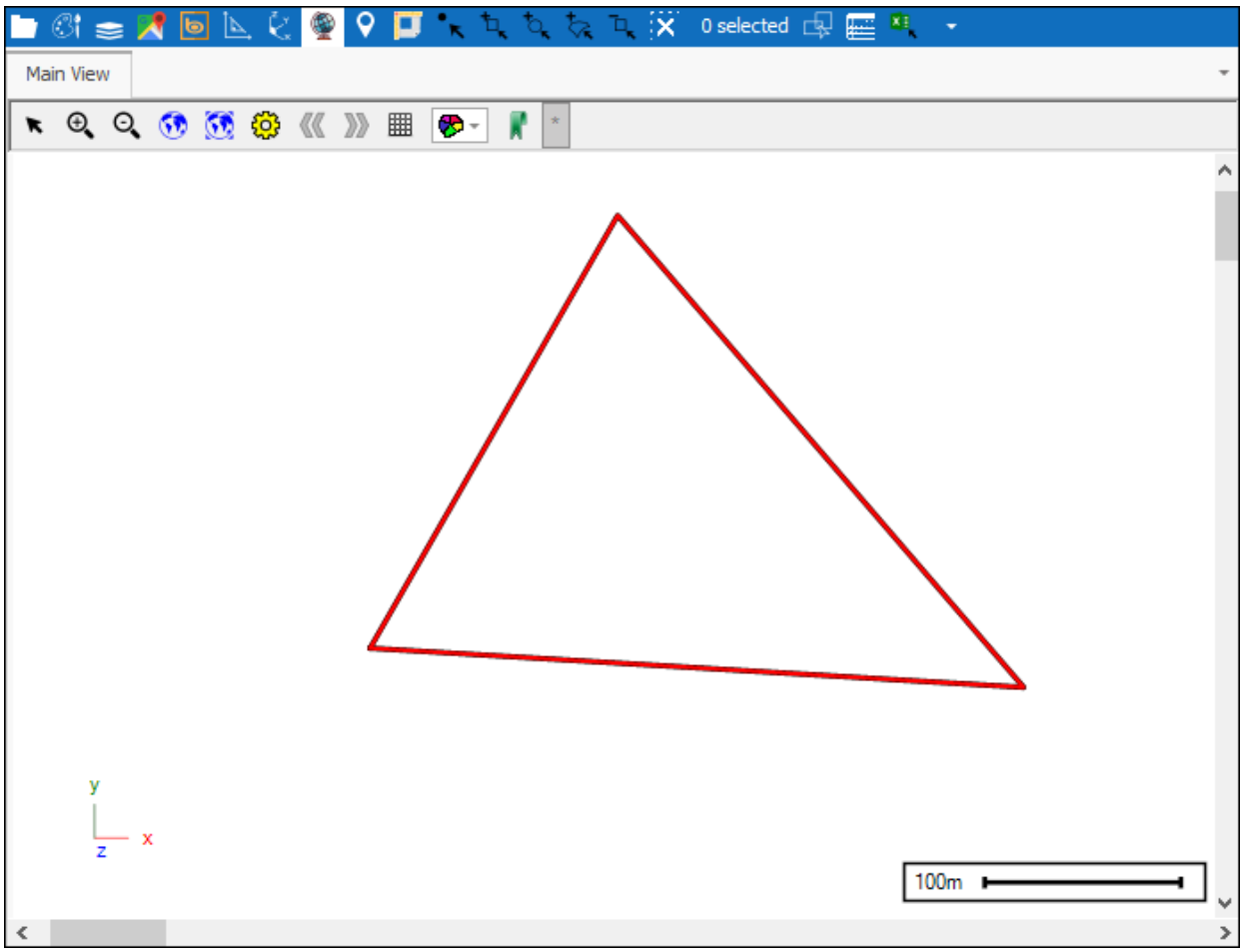

## String convert



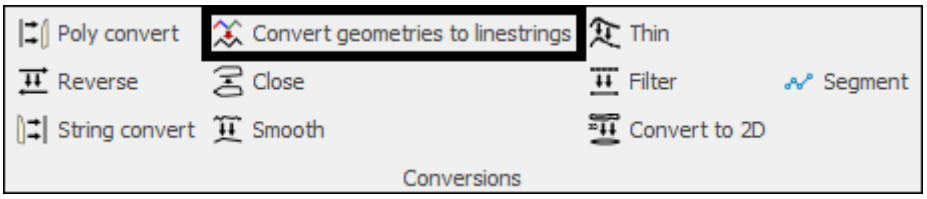

The **String convert** tool will convert selected polygons to linestrings. First select the polygon/s:



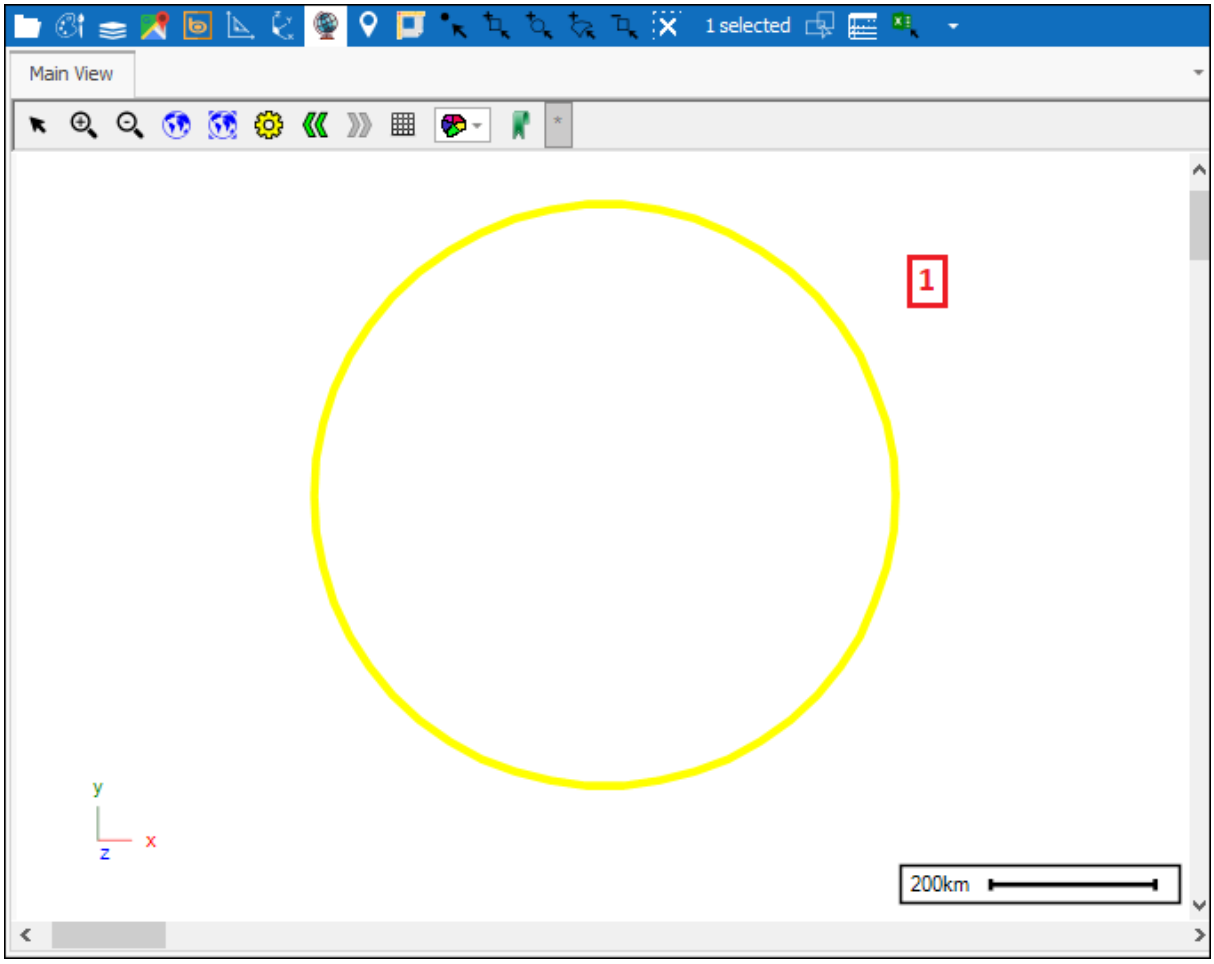

Then click the tool and your polygon has been converted to a linestring:

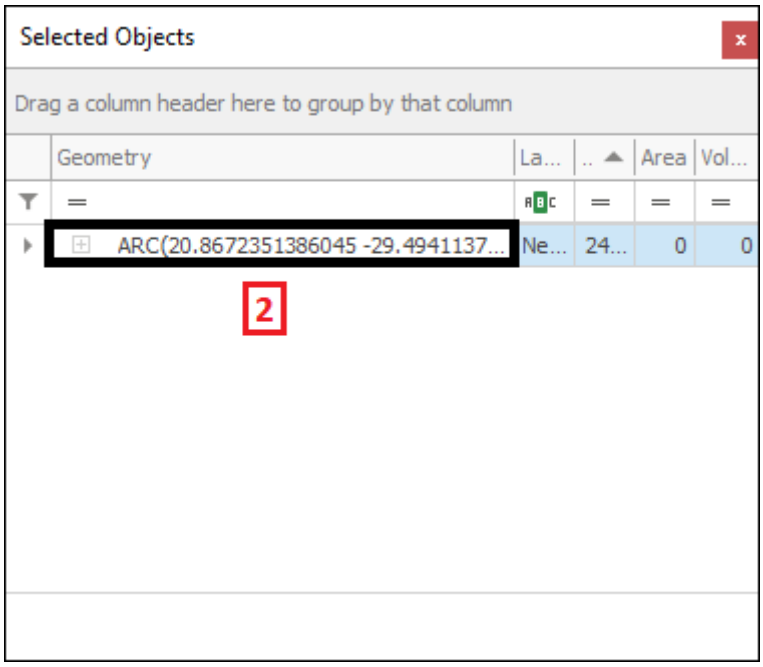


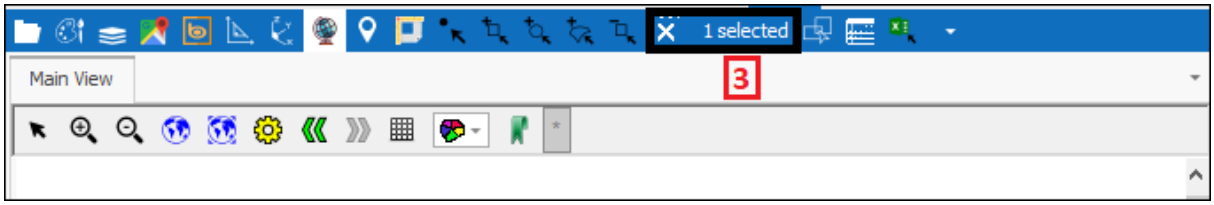

## Convert geometries to linestrings



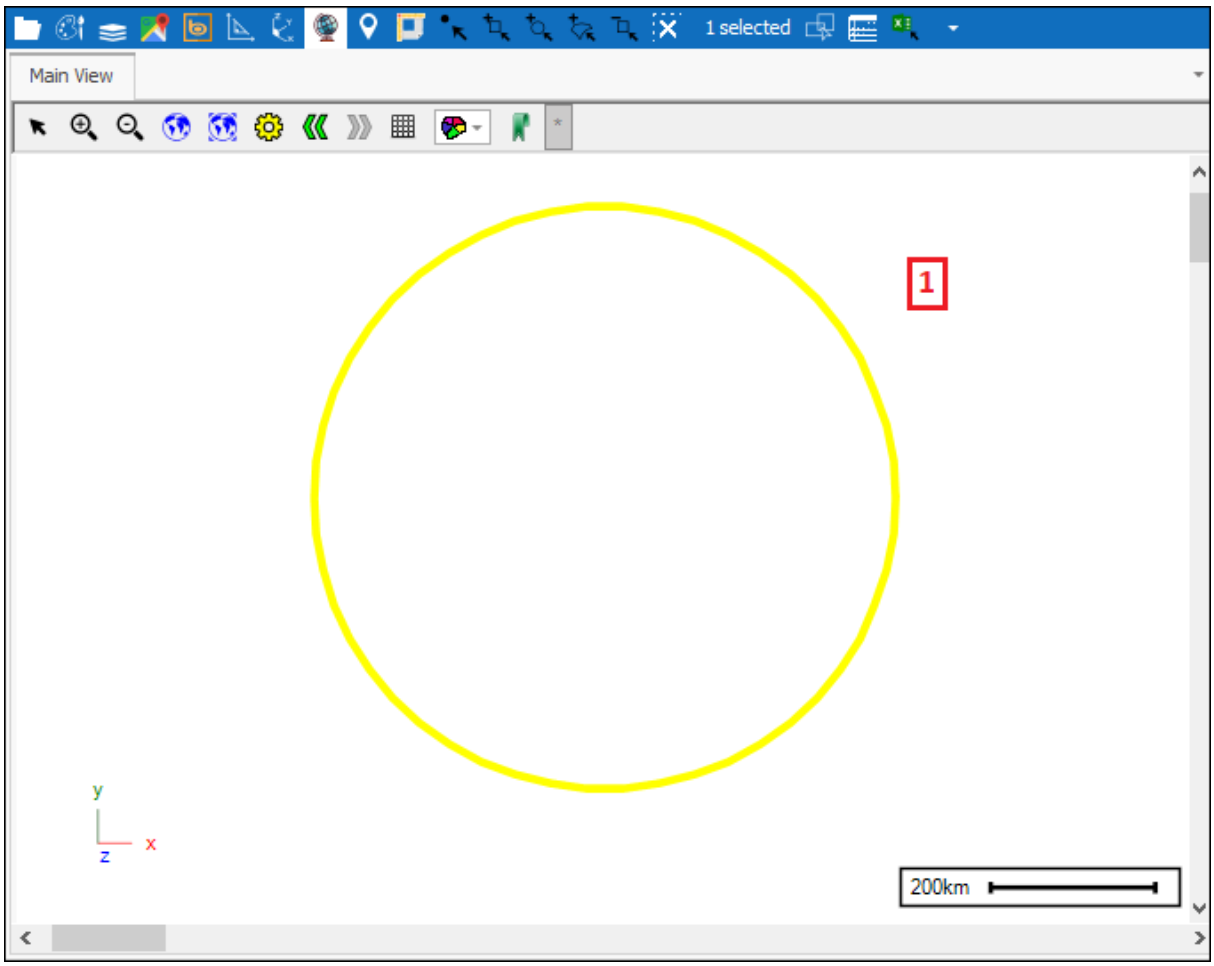

The **Convert geometries to linestrings** tool will convert selected geometries into linestrings. First select the geometries(1), I have also opened up the Selected Objects box so you can see what type of object it is: an ARC(2), you access this by clicking here in the spatial pane(3):

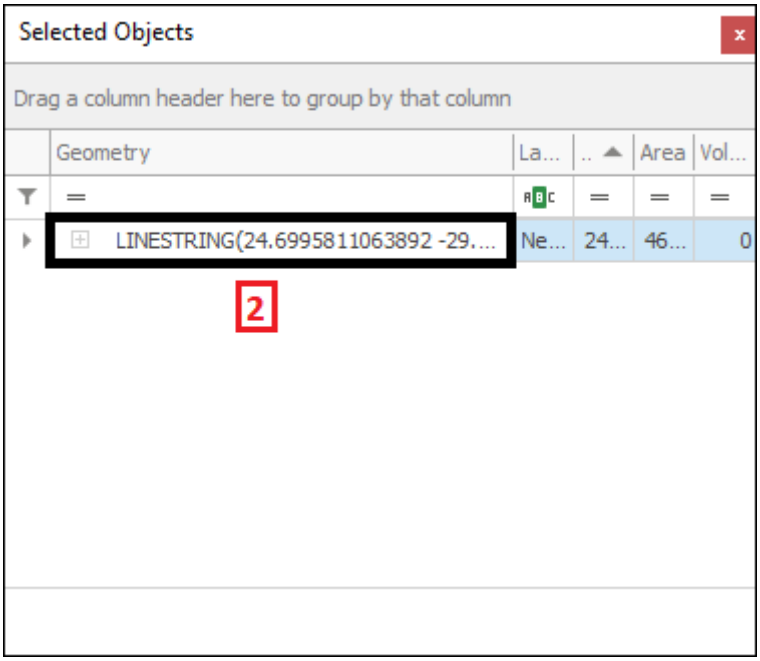

1 selected
Main View
1
y
x
z
200km


Selected Objects
Drag a column header here to group by that column
Geometry
La...
Area
Vol...
ARC(20.8672351386045 -29.4941137...
Ne...
24...
0
0
2

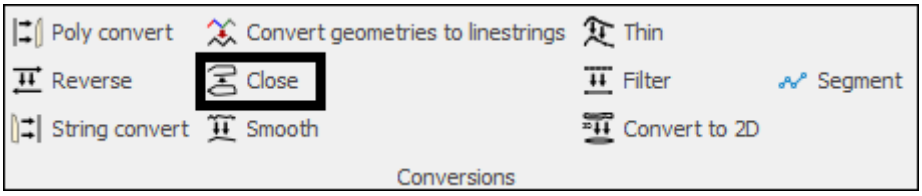



Then click the tool and although there's no visible change in the scene(1) we can see in the Selected Objects box that this is now a linestring(2):

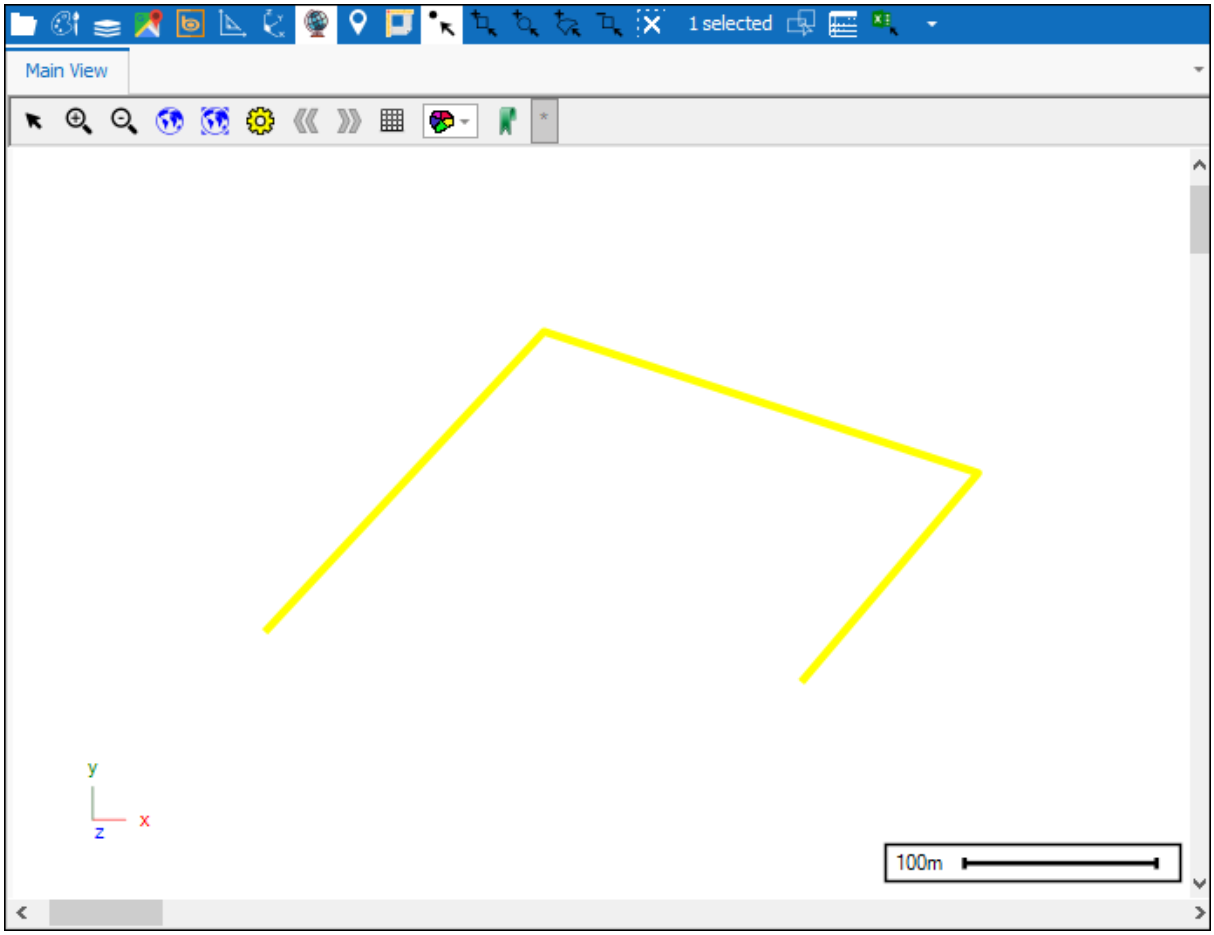




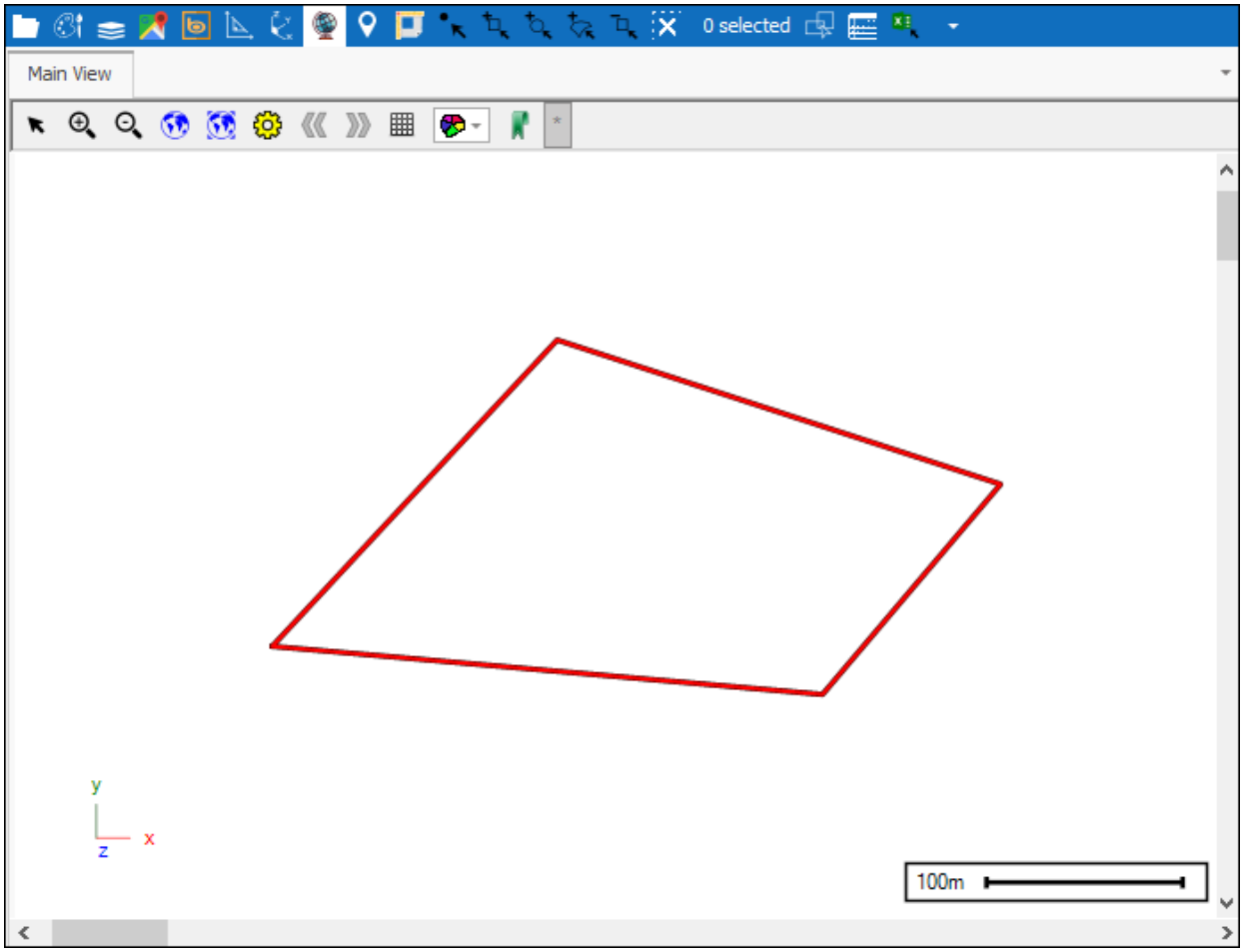

## Close



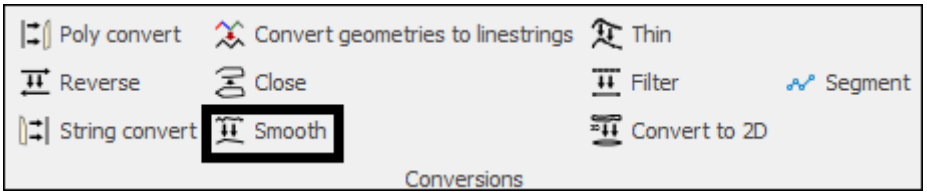

The **Close** tool will close selected linestrings. First select the linestring/s:



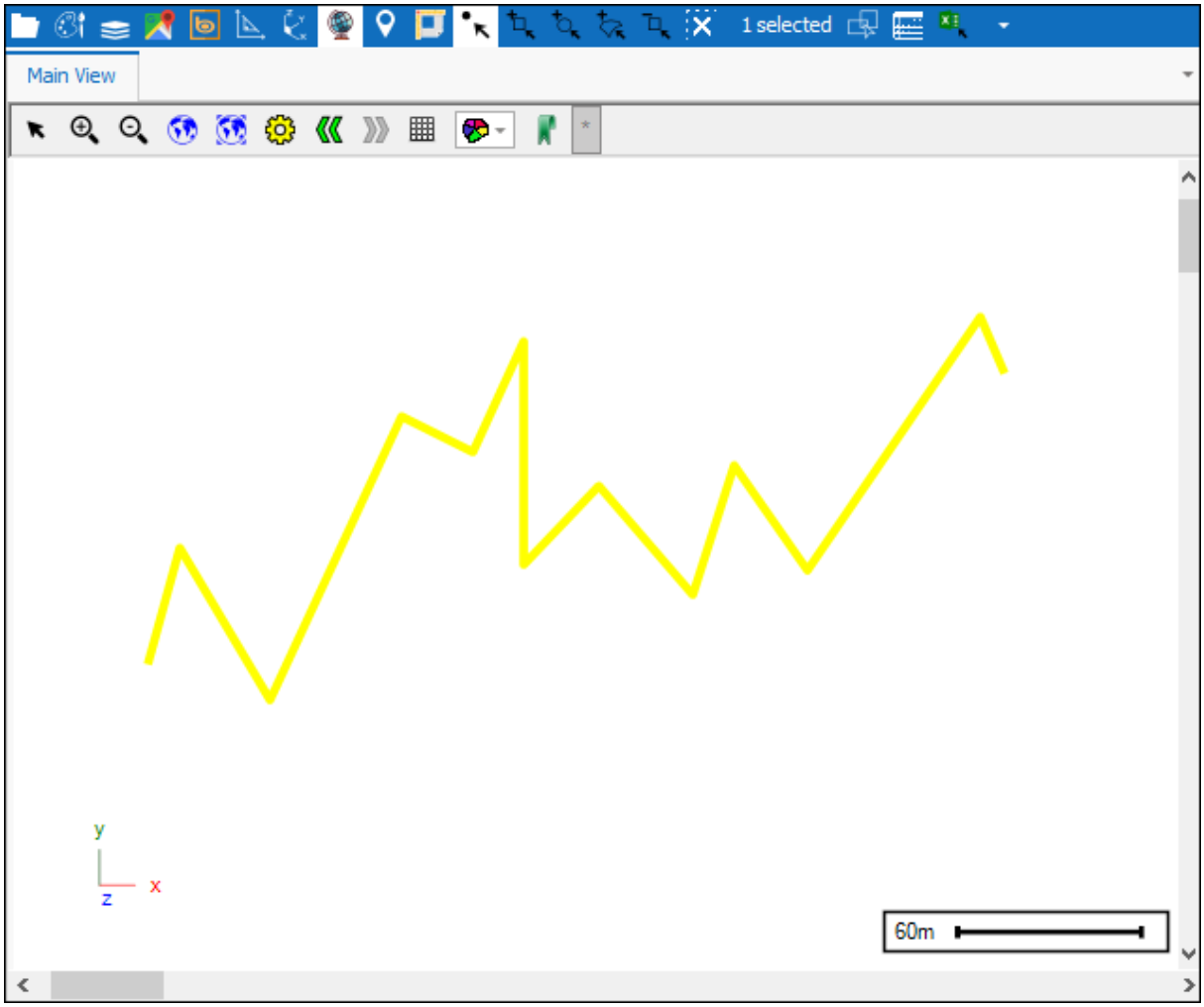

Then click the tool and the linestring has been closed:



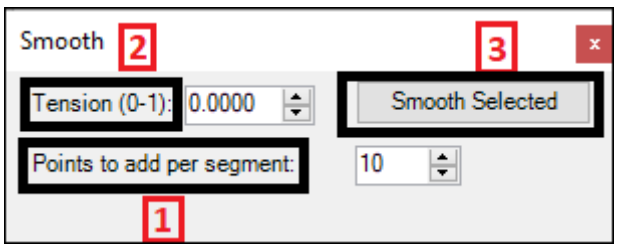

## Smooth

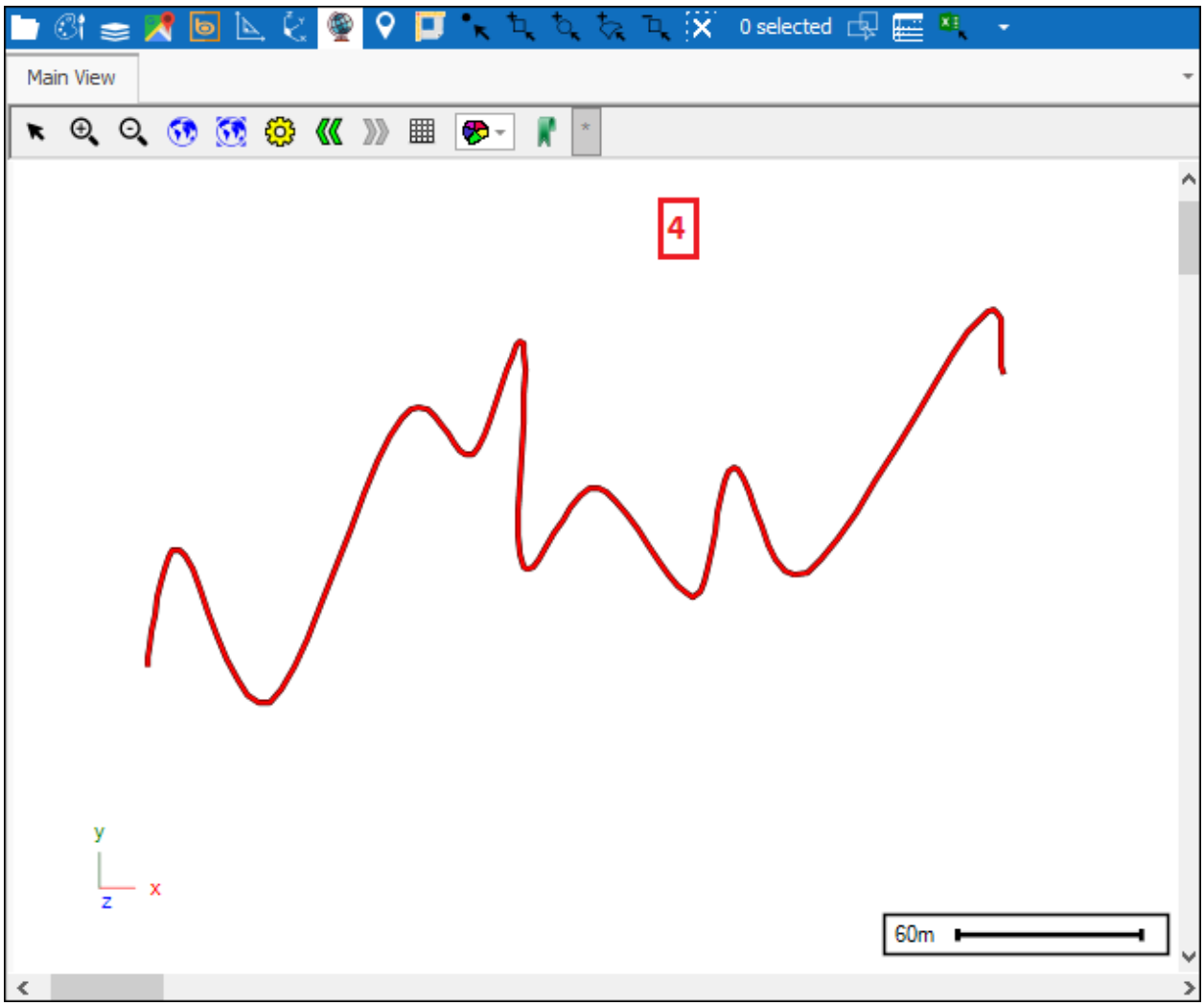



The **Smooth** tool will smooth out linestrings and polygons. First select the object:

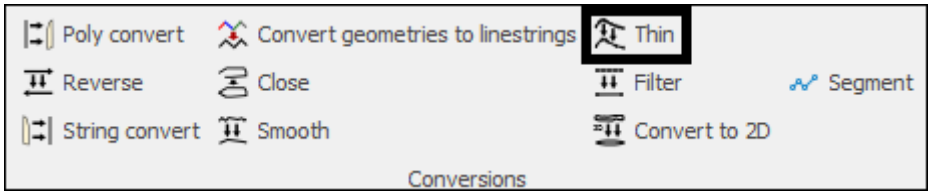



Then click on the tool which will bring up the **Smooth** dialogue. Choose how many points you'd like to be added per segment by **Points to add per segment**(1), the more points the smoother the object will be made, and then choose the tension of the curve by **Tension(0-1)**(2), 0 for lowest tension and 1 for highest tension(straight lines), when done click **Smooth Selected**(3) and your object will have been smoothed(4):

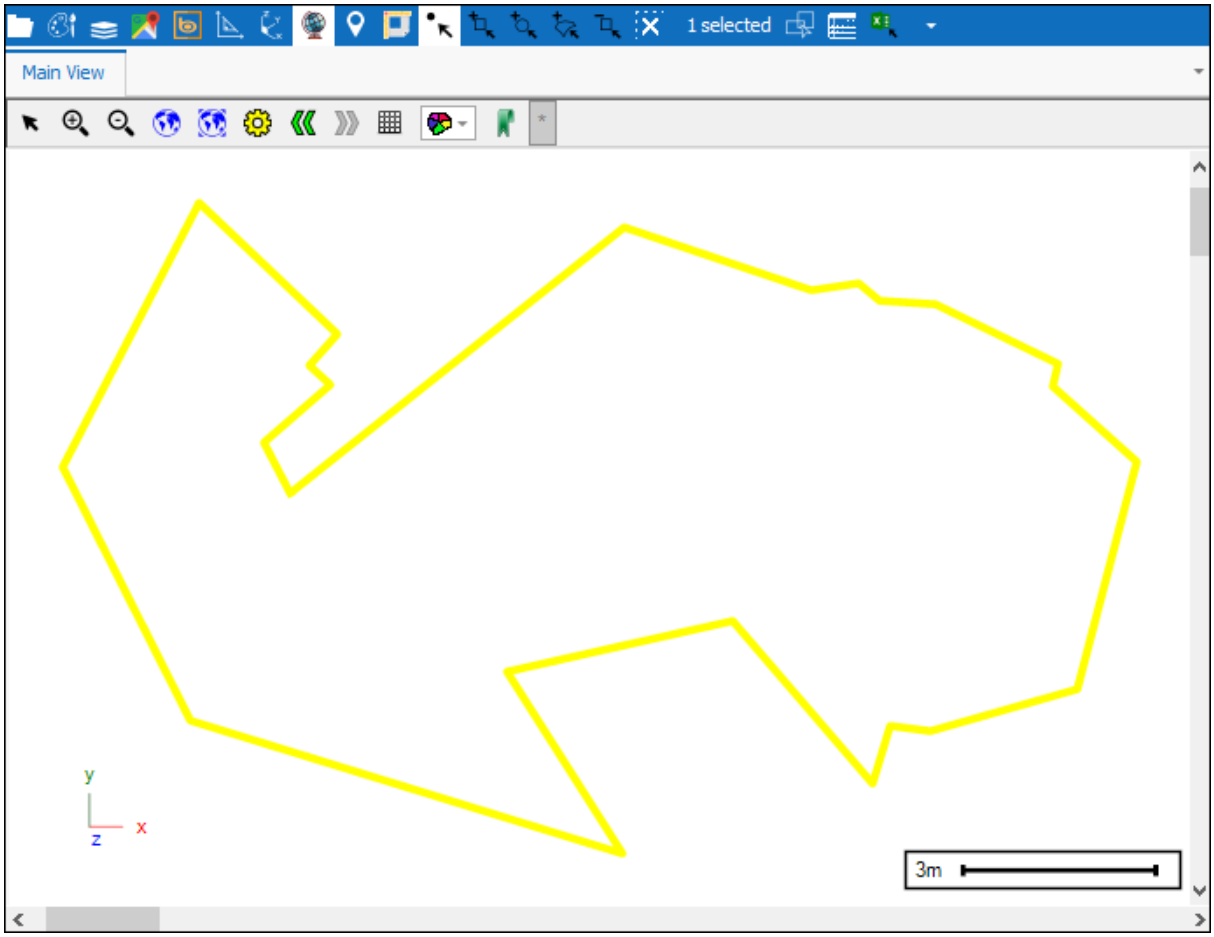




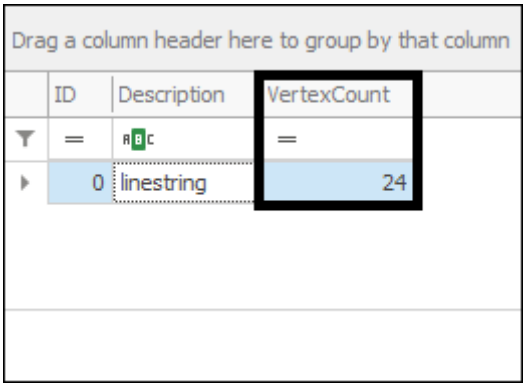

## Thin




The **Thin** tool will thin the amount of points per segment of a linestring or polygon, which is to say make less points, while trying to retain the original shape of the item as best as possible. First have your item/s selected:

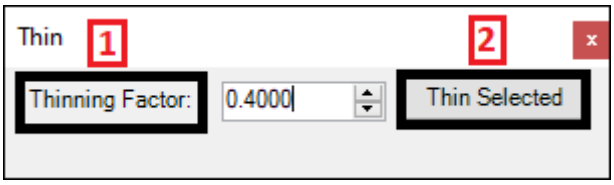


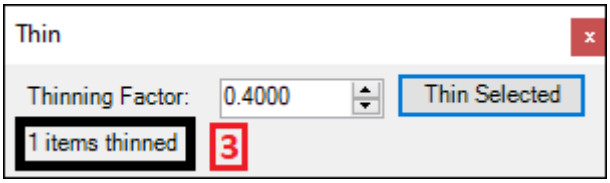

In the layer data of this linestring I added a Calculated Column where you can see the amount of vertices it currently has:

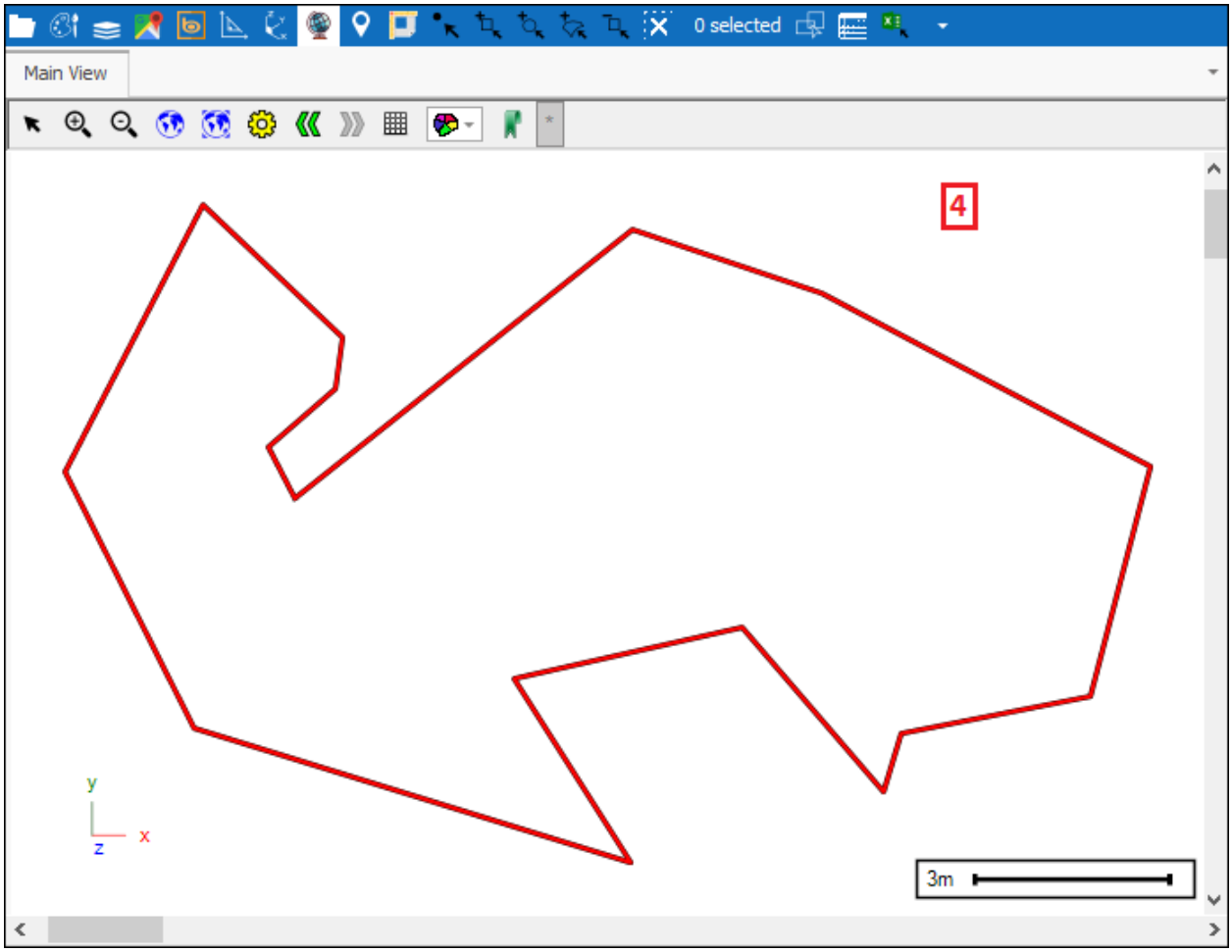


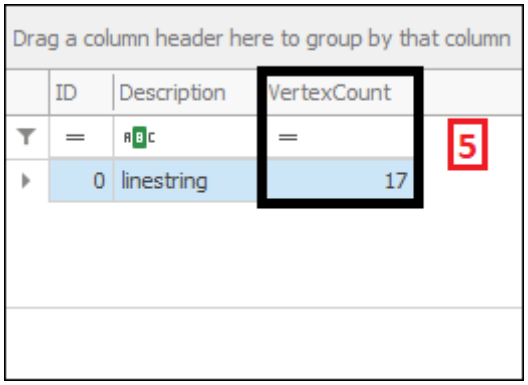

Click on the tool which will bring up the following dialogue. The **Thinning Factor**(1) is the sine of the minimum angle to preserve between adjacent segments. Set this as needed and then when done you can click **Thin Selected**(2)

and your item will have been thinned(3)(4). You can then see in the layer data how the vertices have been thinned as well(5):

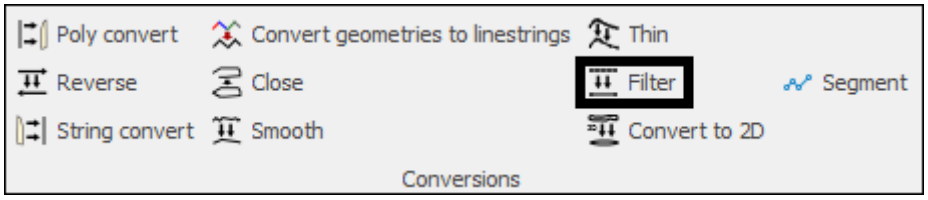


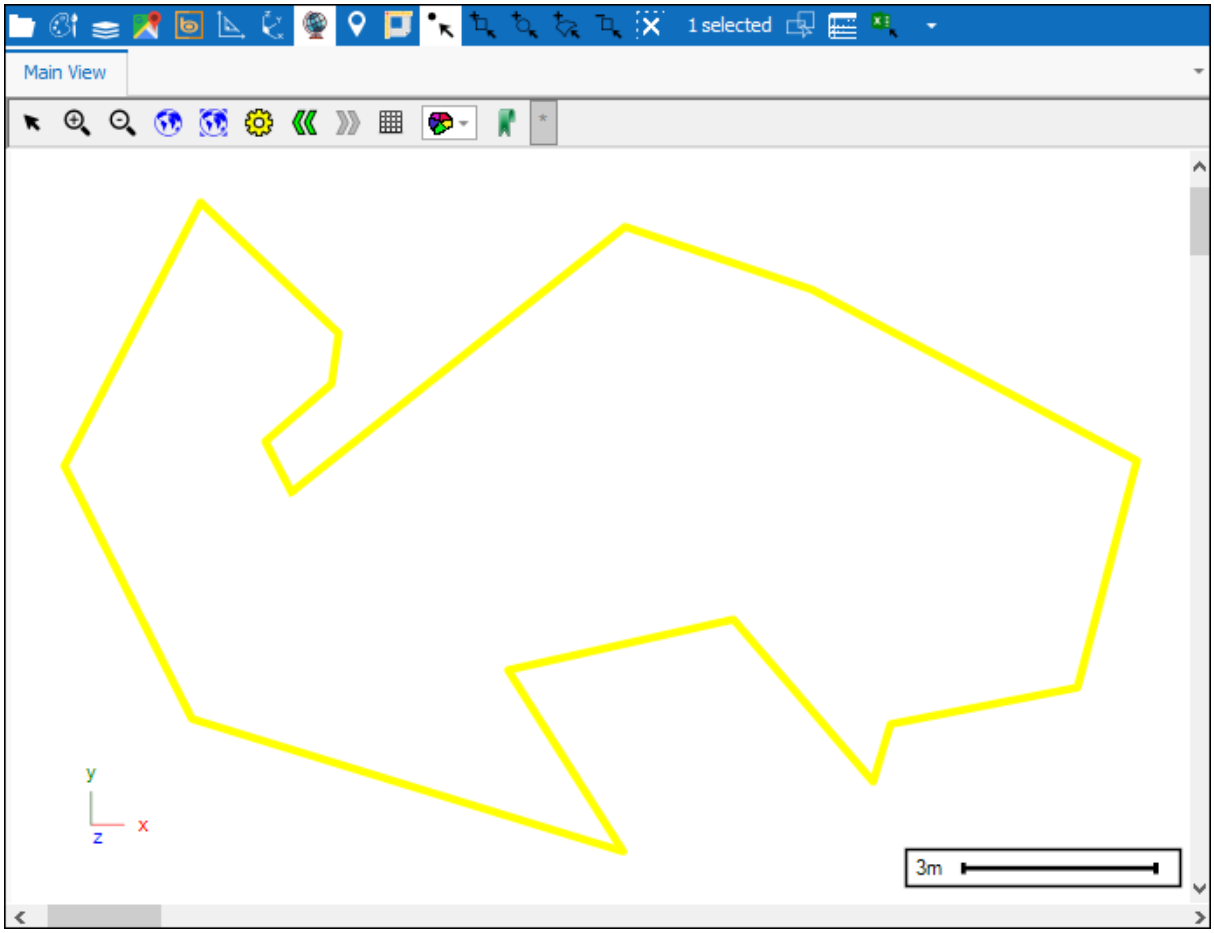





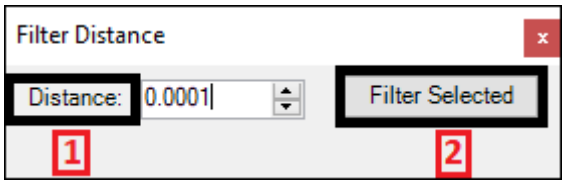

## Filter

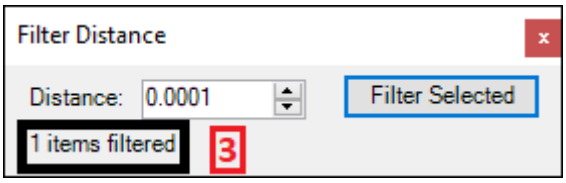


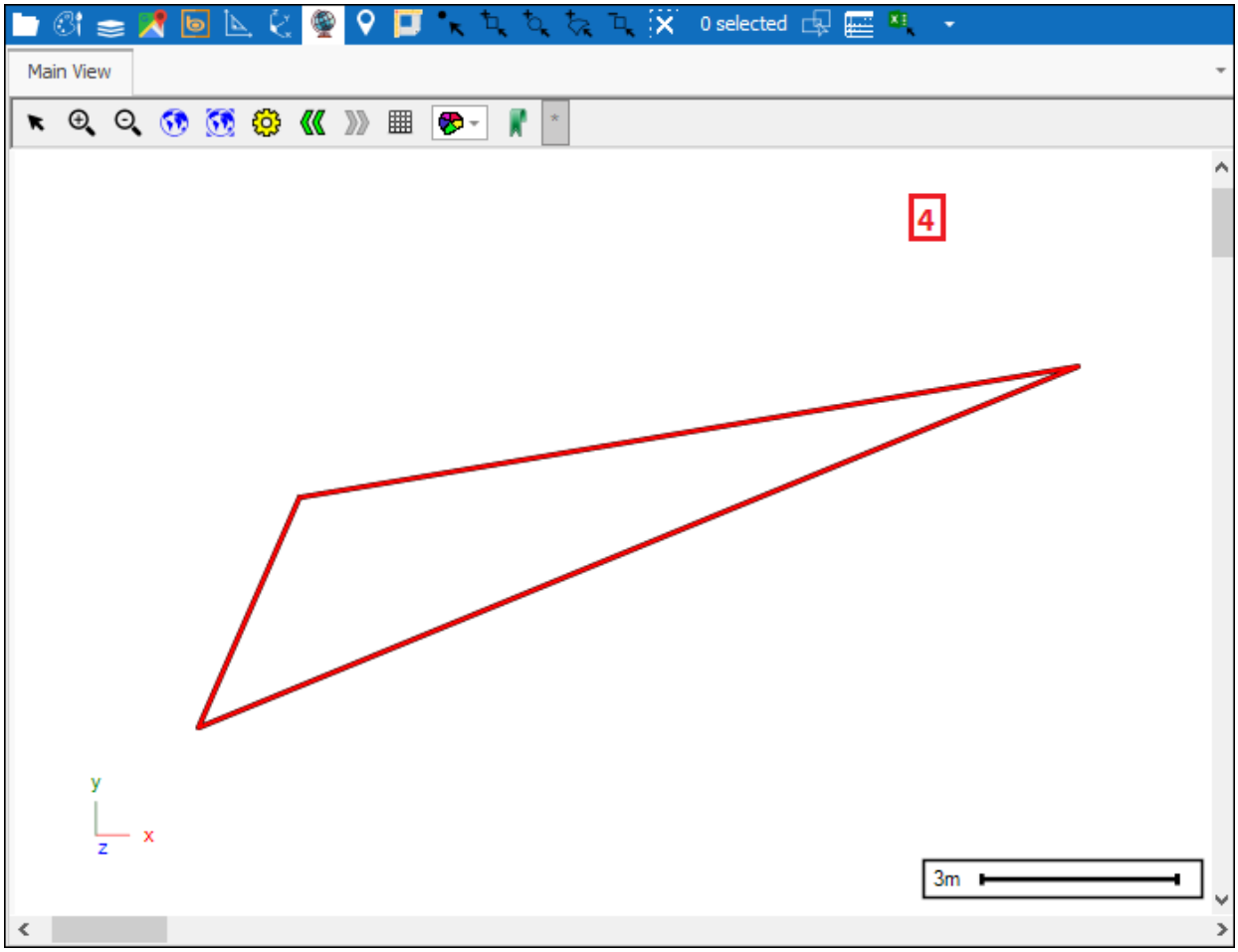

The **Filter** tool will make sure that there is only one vertex/point within a certain distance along a linestring or polygon and get rid of any excess. First select the item:



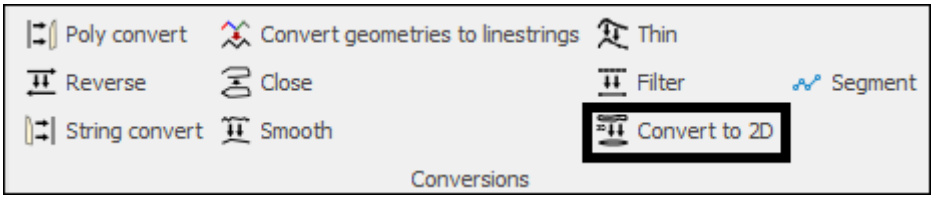

Then click the tool which will bring up the following dialogue. Choose the **Distance**(1), which is in degrees, and then click **Filter Selected**(2) and the item has been filtered(3)(4):



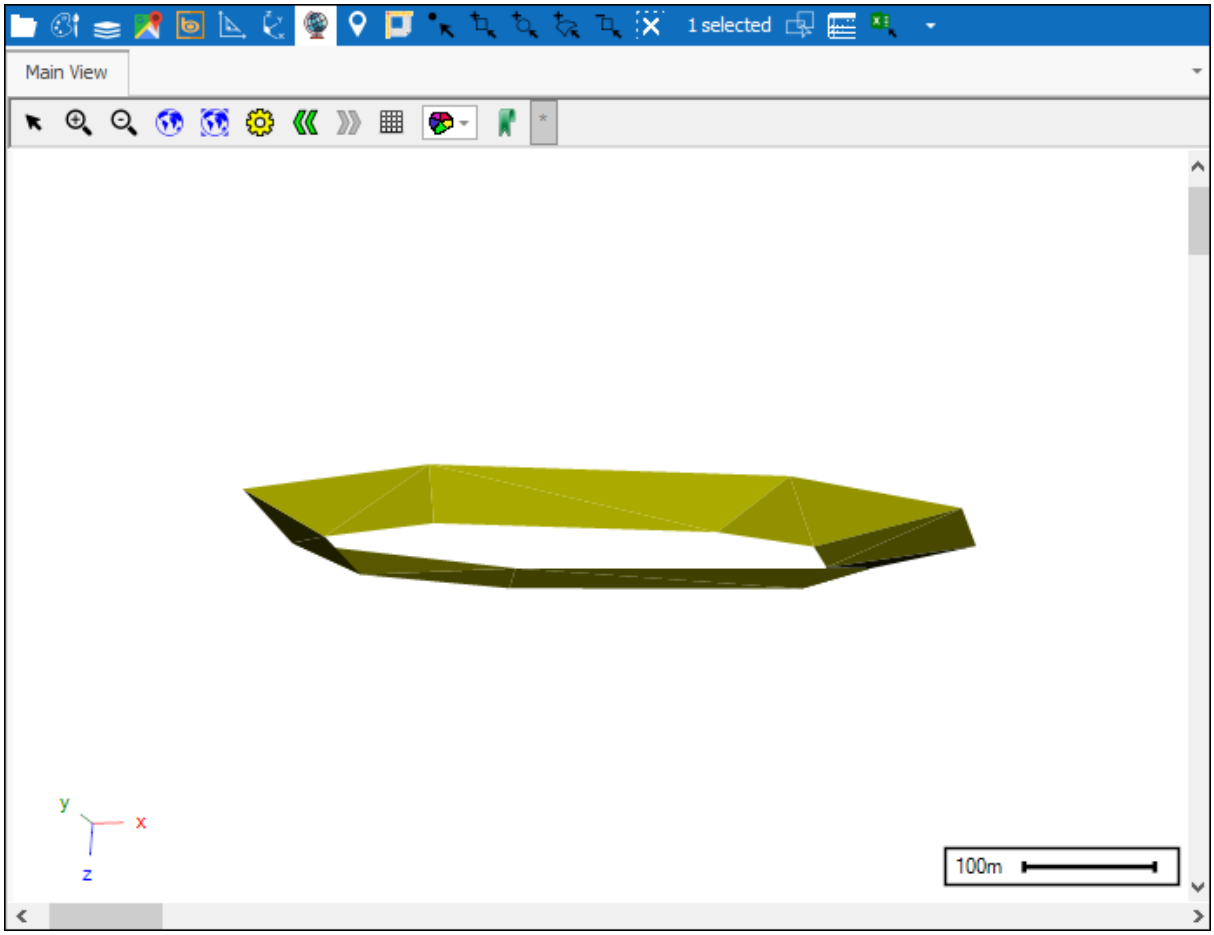






## Convert to 2D

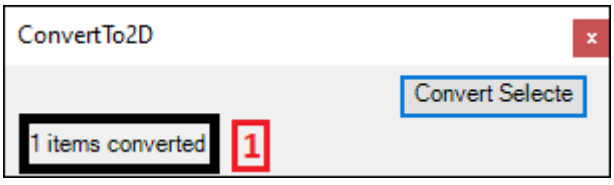


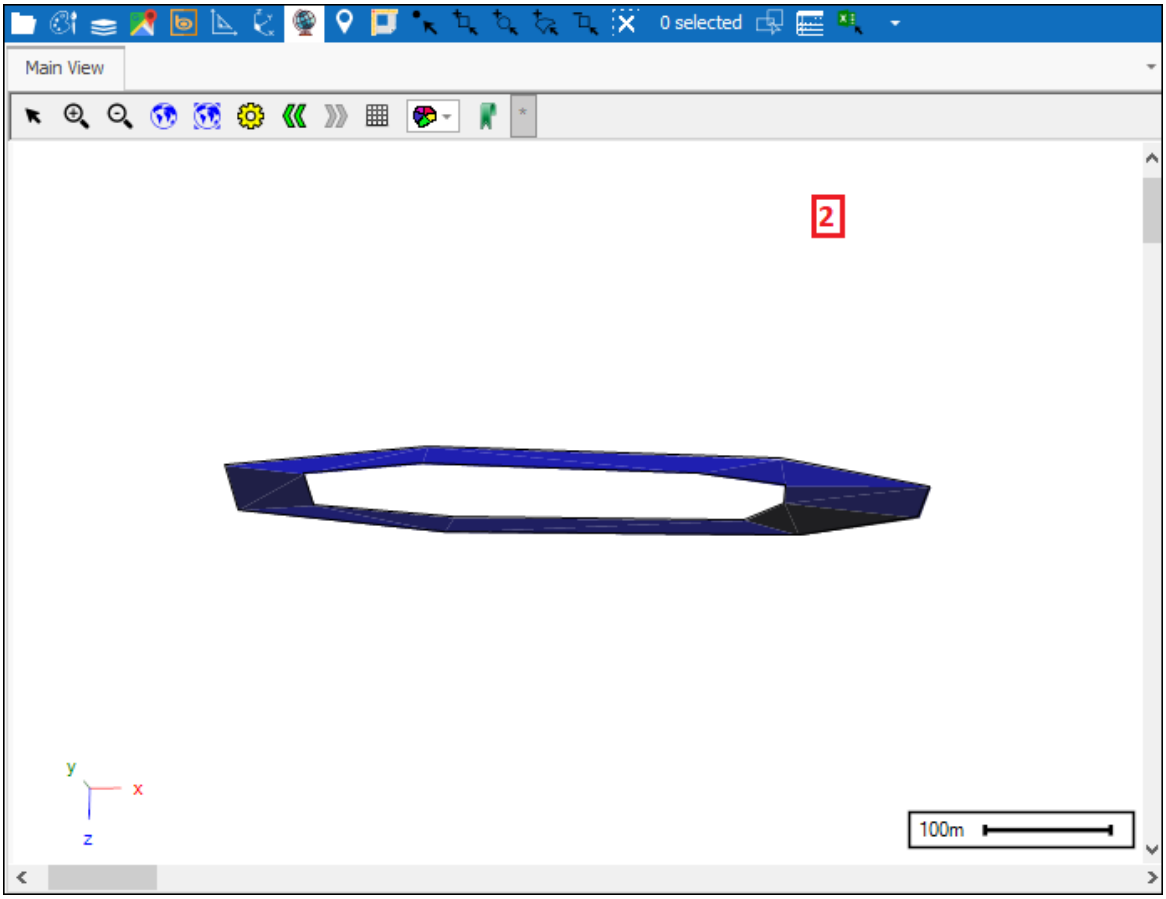

The **Convert to 2D** tool will convert selected 3D items to 2D. First select the item:



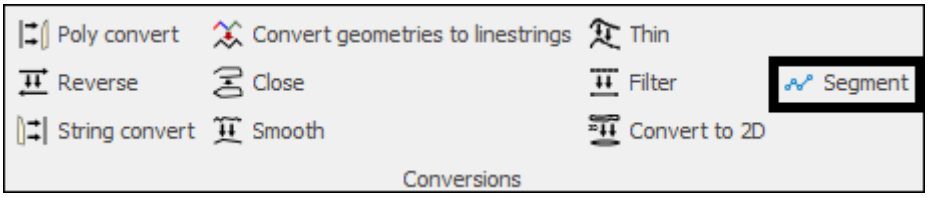

Then click the tool which will bring up the following dialogue. Click **Converted Selected**:


And your item will have been converted(1)(2):

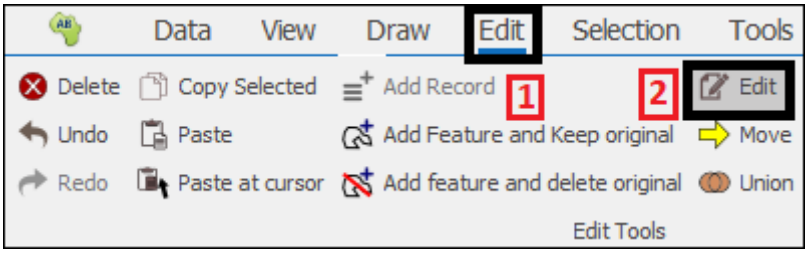


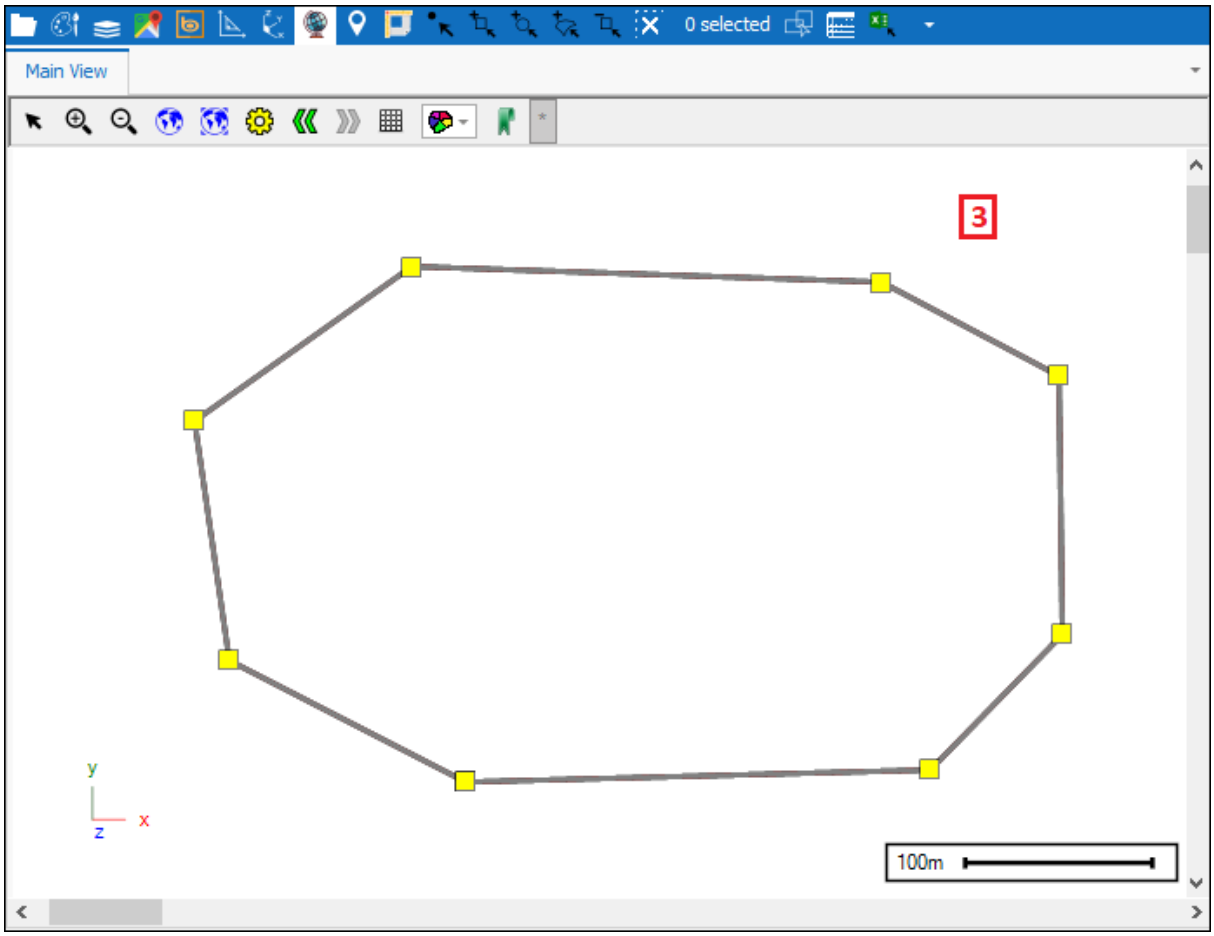



## Segment

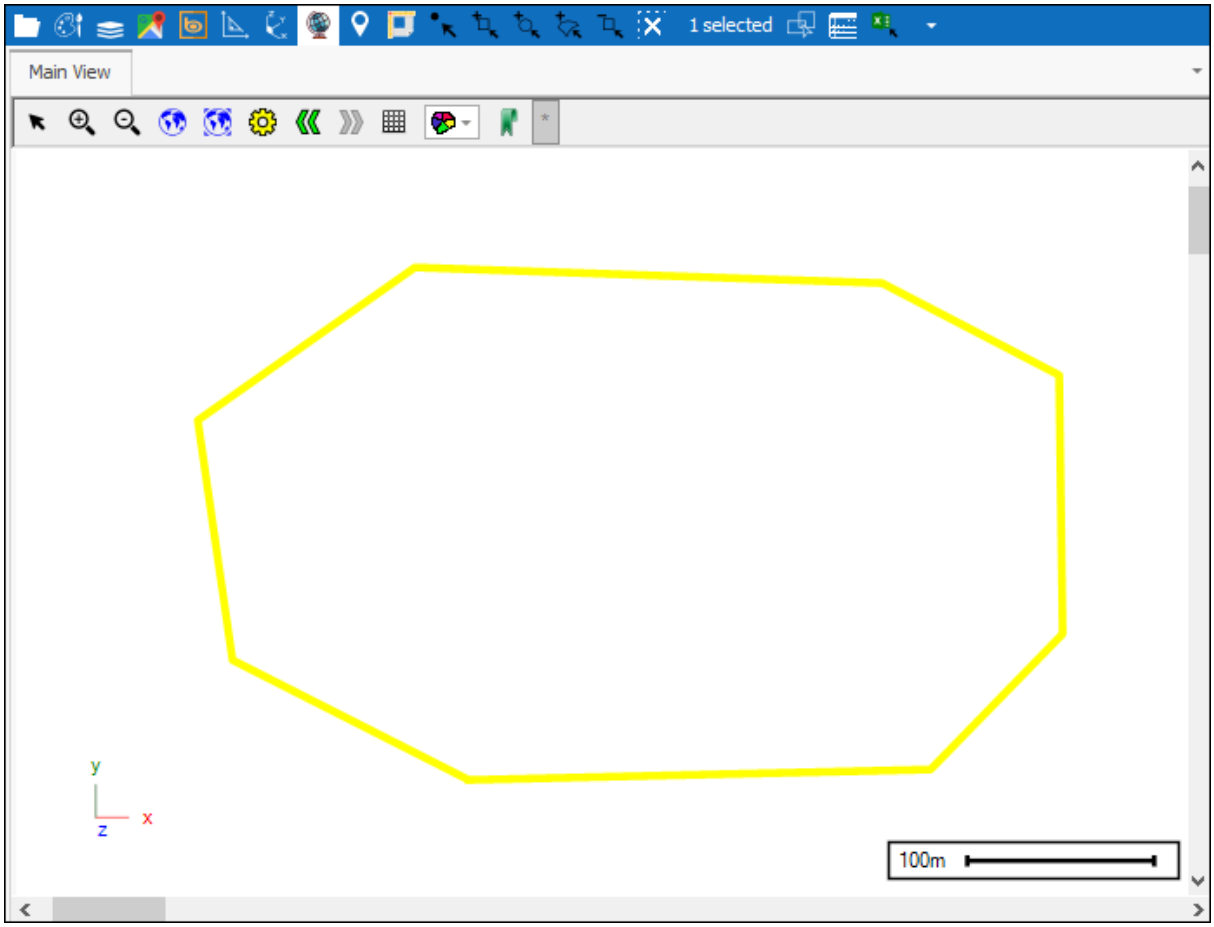



The **Segment** tool will make sure each segment in geometry is smaller than a given value. This is used to prepare geometries for other operations which work better with geometry segments limited in size. First thing I did is go to the **Edit**(1) tab and use the **Edit**(2) tool to select my item so I can see its vertices and segments(3):

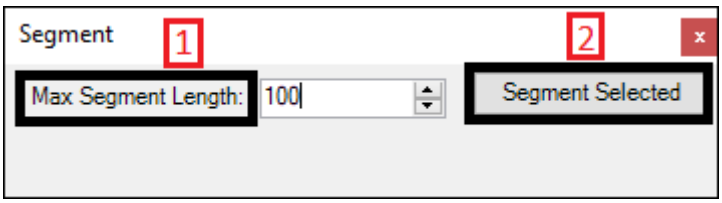


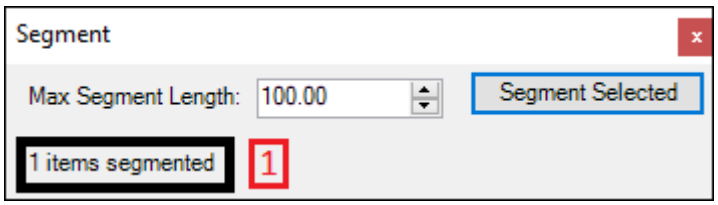

Now I will select the item using one of the selection tools:

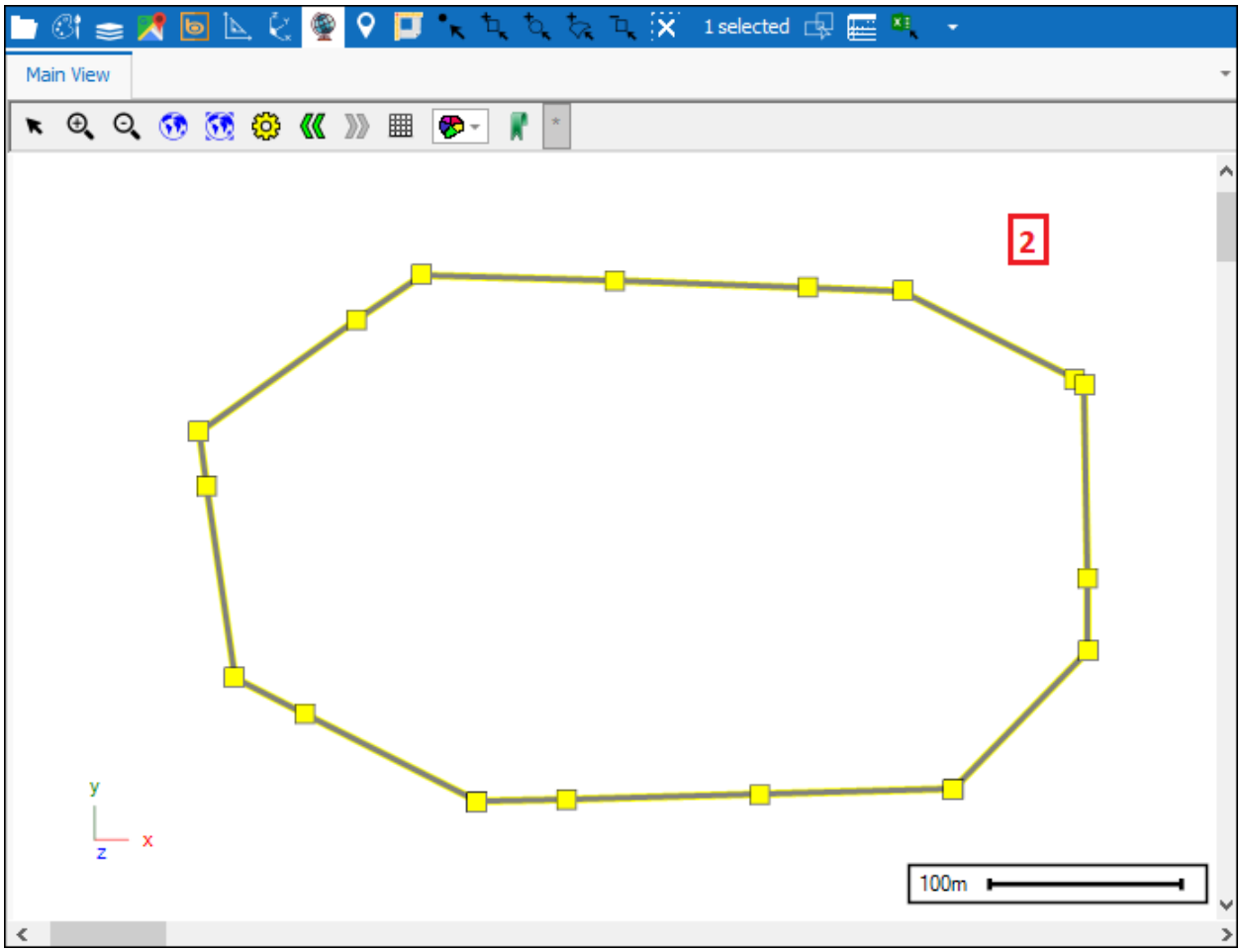



Then click the tool which will bring up the following dialogue. Put in your **Max Segment Length**(1)(meters) which will make sure no segment in your item is greater than that distance. Then click **Segment Selected**(2):

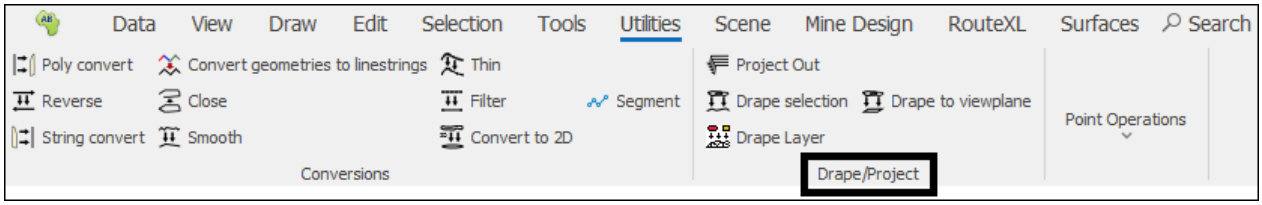



The item has now been segmented(1) and you can see the result by again selecting the **Edit** tool and then selecting your item to see how the segments now look(2). As you can see there are no segments now greater than 100 meters in length:



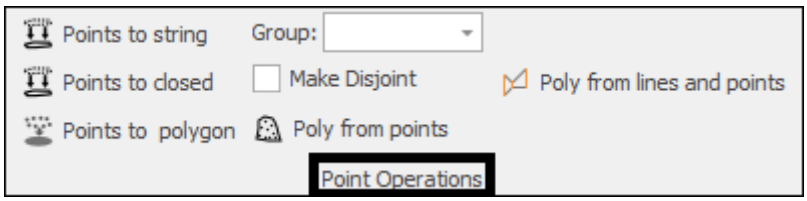




## Drape/Project

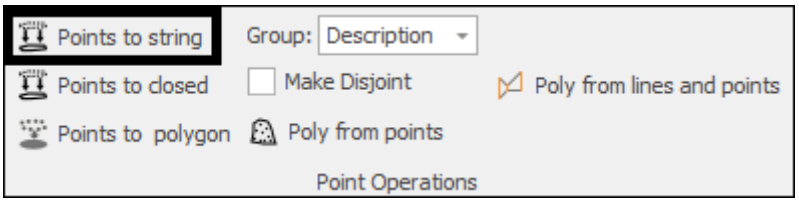



The tools in the **Drape/Project** section of the **Utilities** tab are covered in the *Drape Tools guide* and the *Project Out Tool guide*.

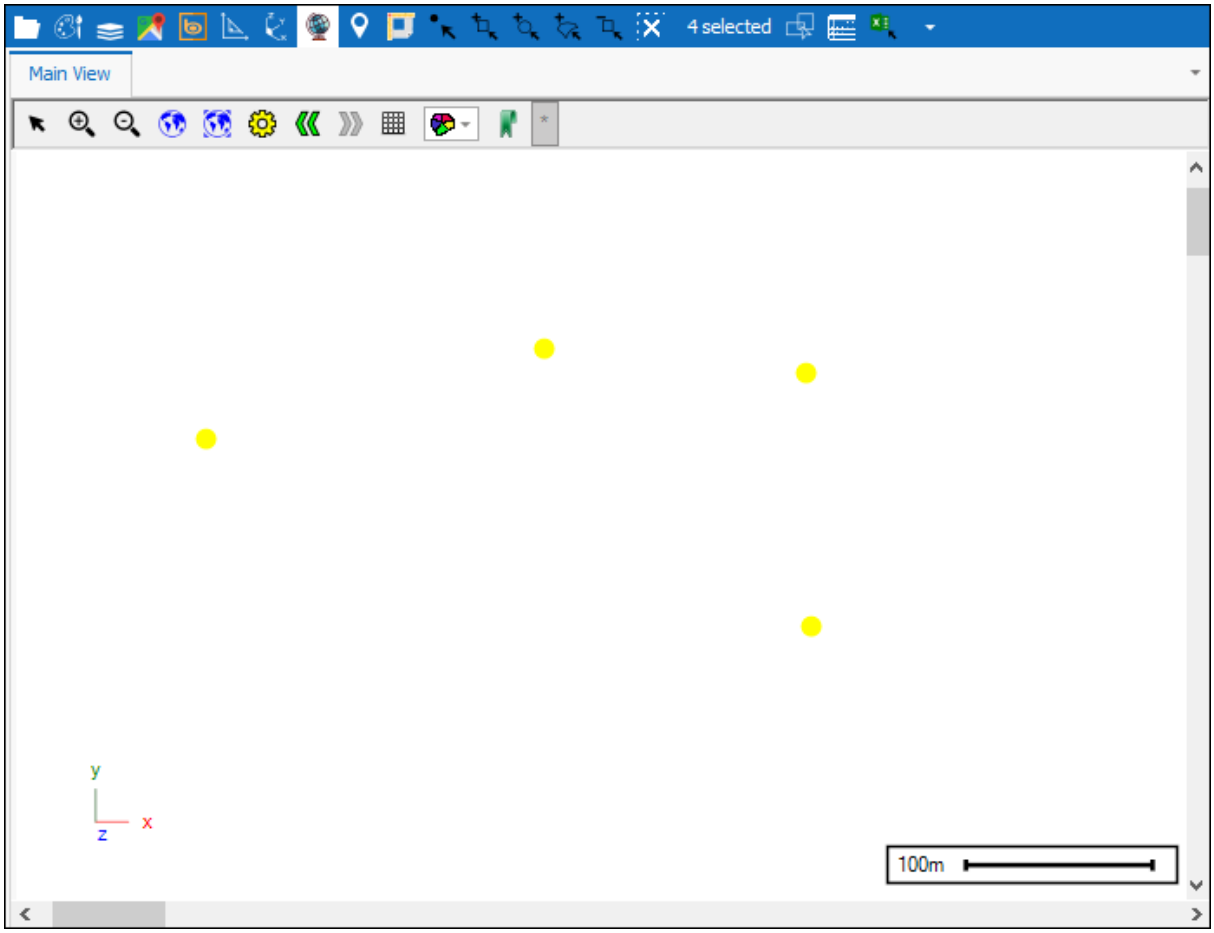
# Point Operations



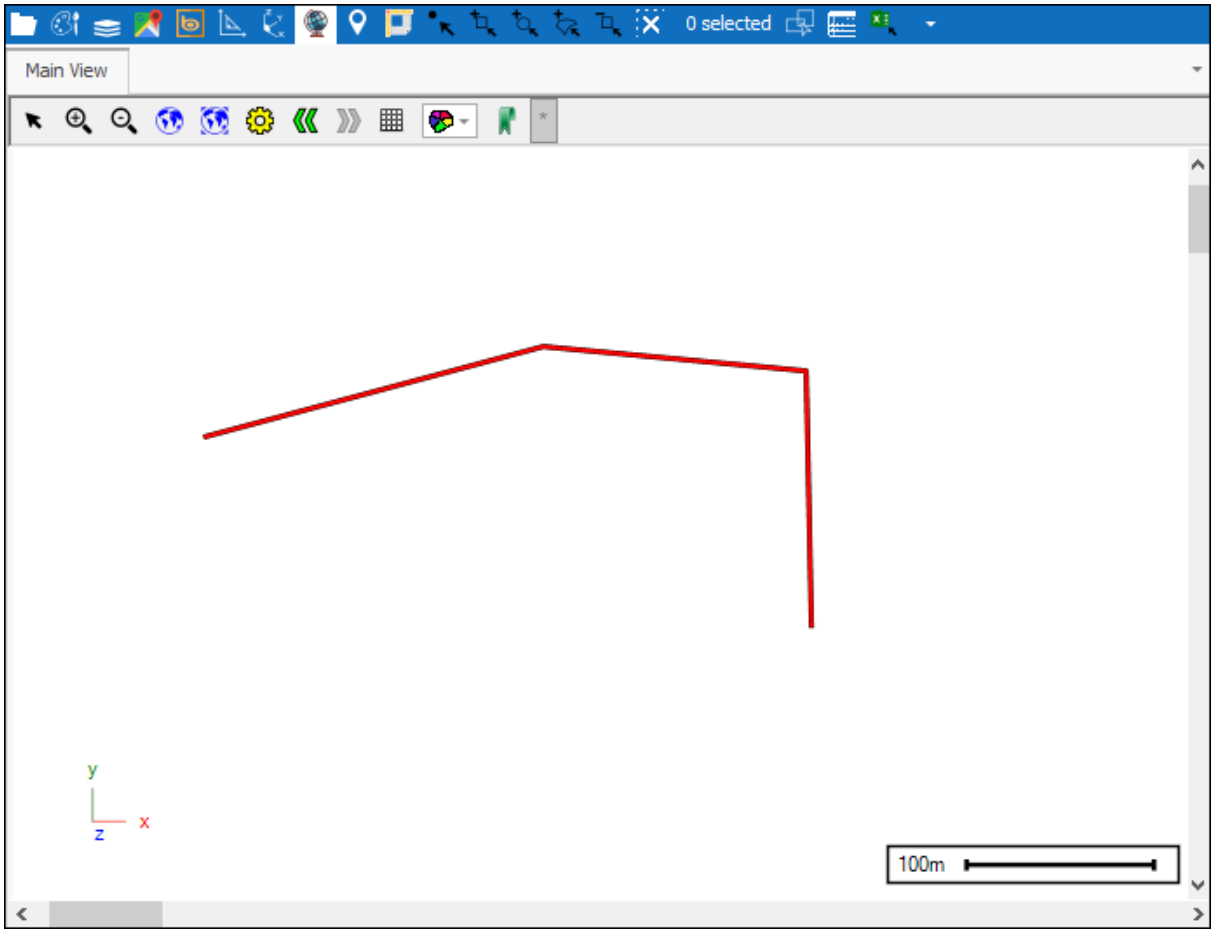

## Points to string



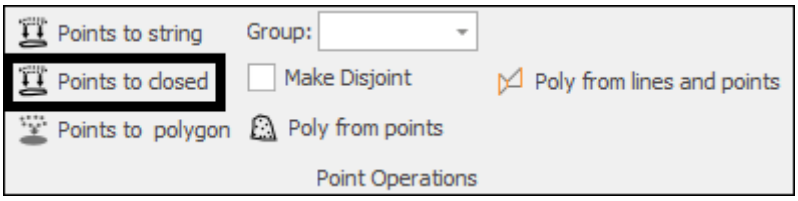

The **Points to string** tool will create a linestring from selected points (It will be drawn to any active layer). First select your points:



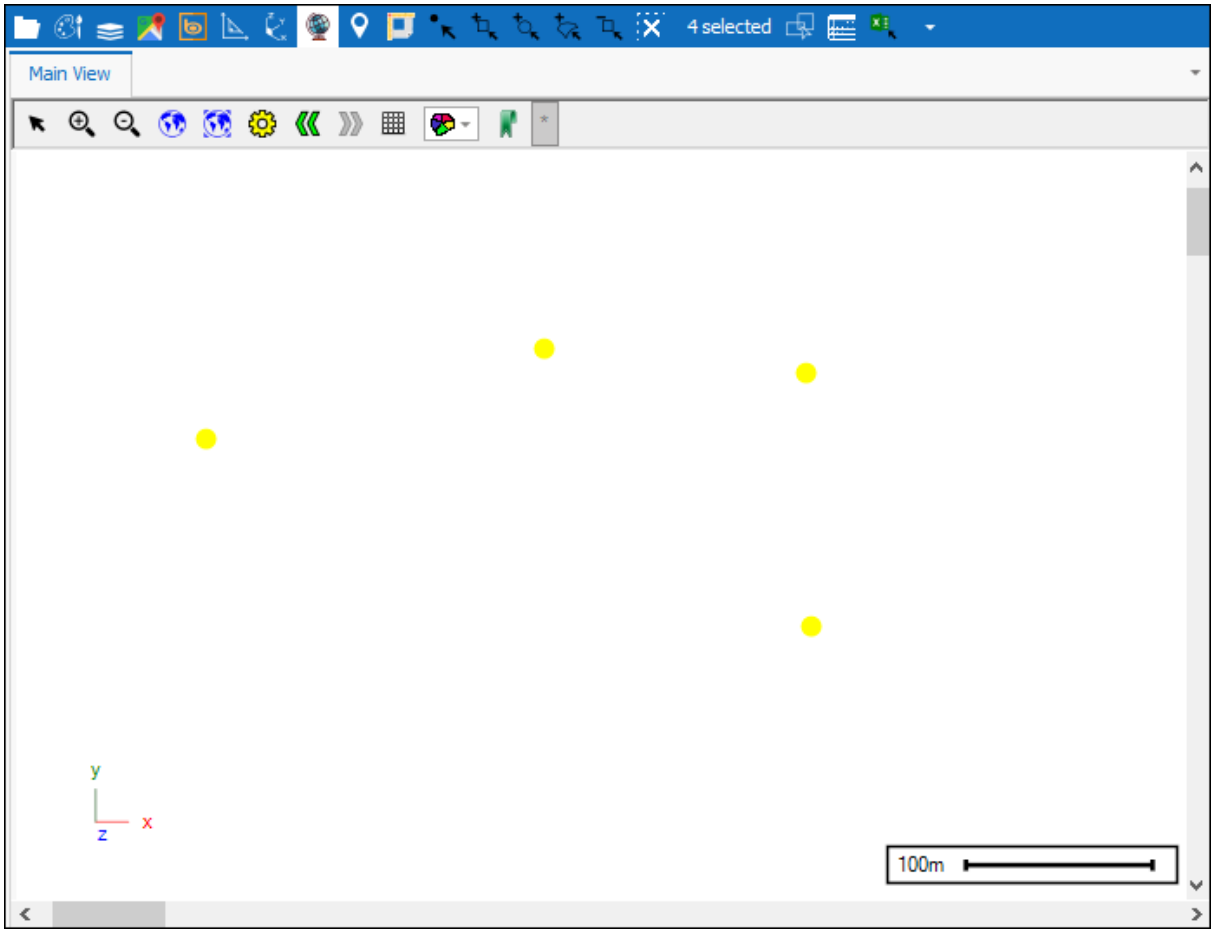

Then click the tool and the linestring has been created:



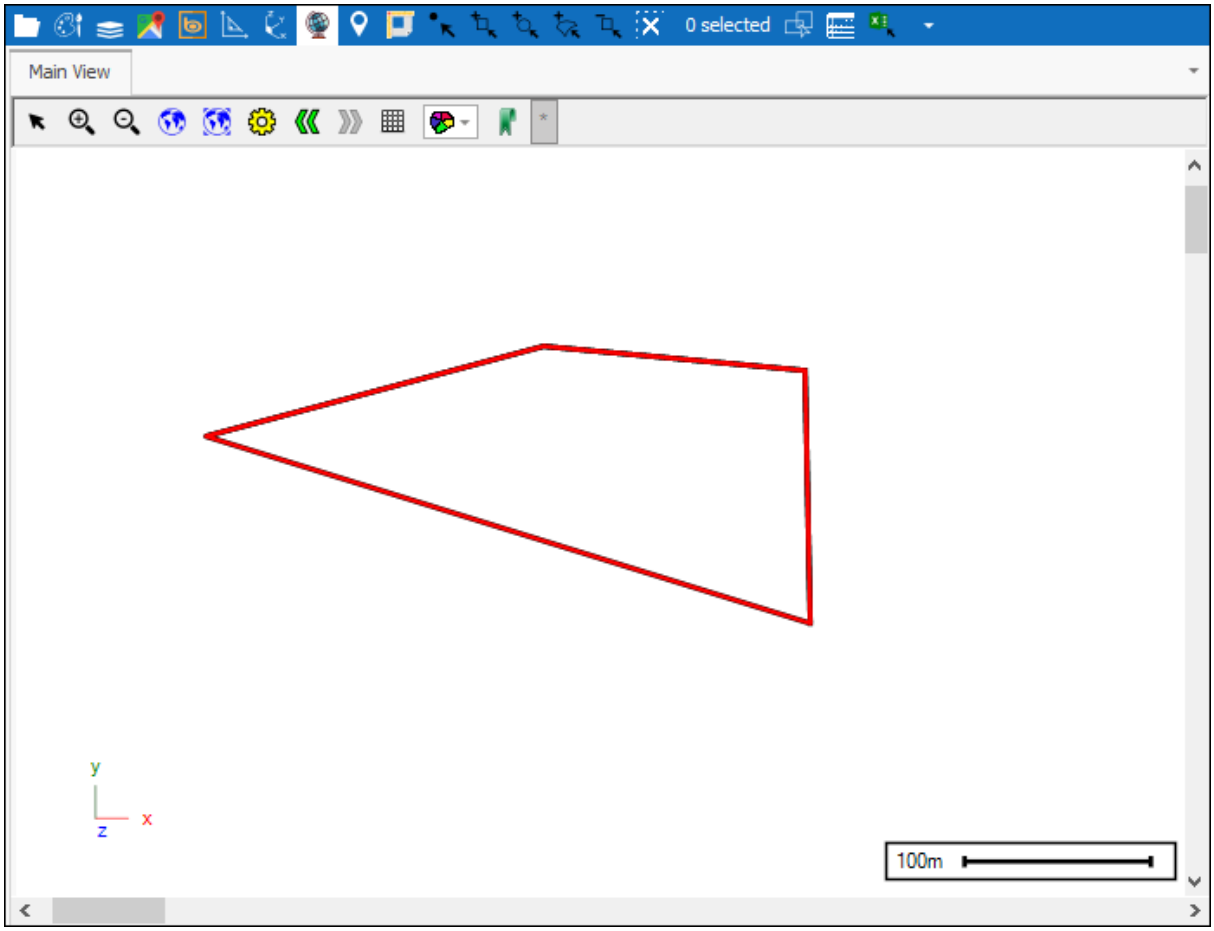

## Points to closed



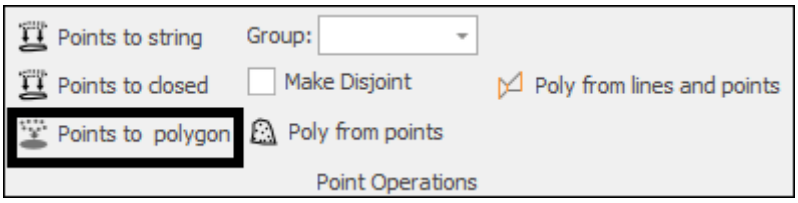

The **Points to closed** tool will create a closed linestring from selected points (It will be drawn to any active layer). First select your points:



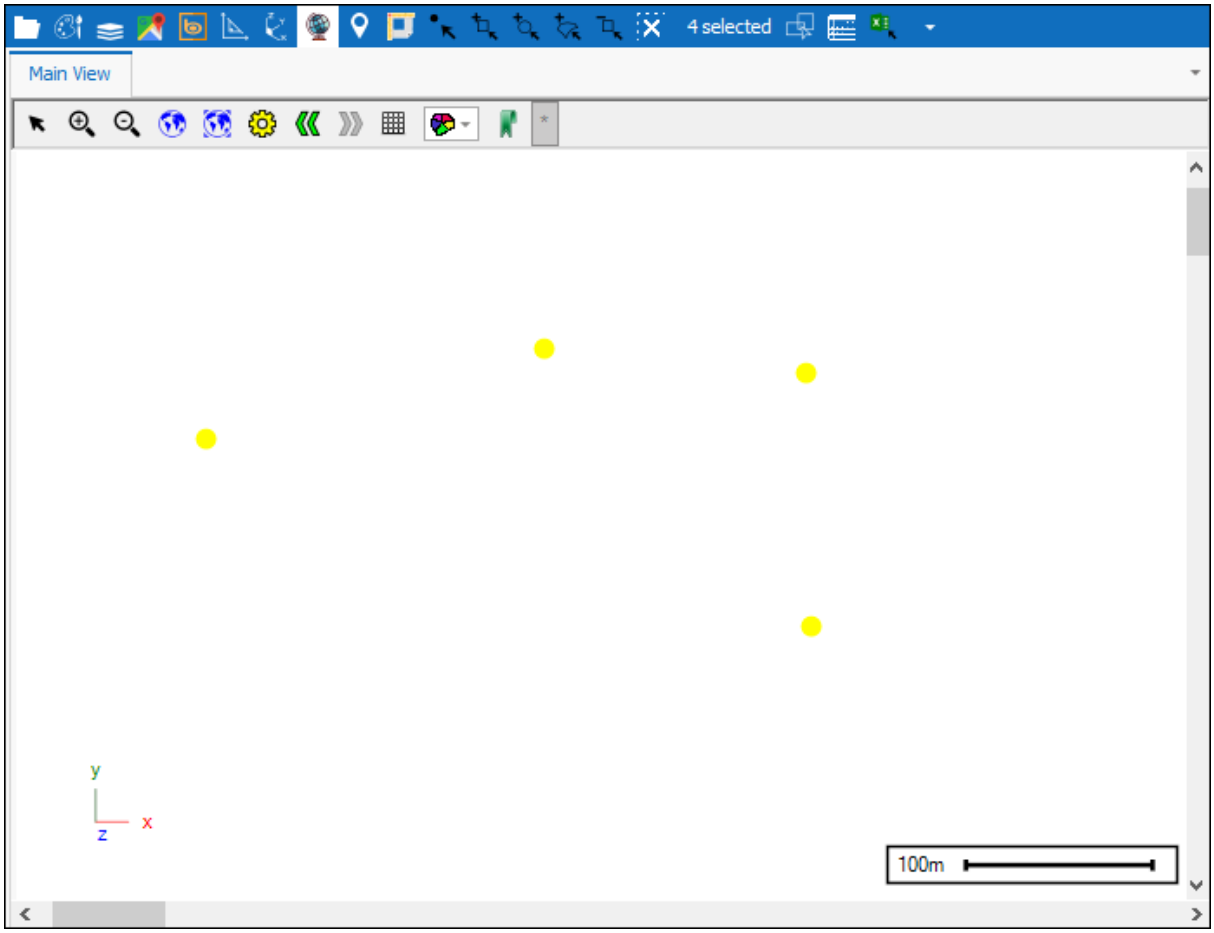

Then click the tool and the closed linestring has been created:



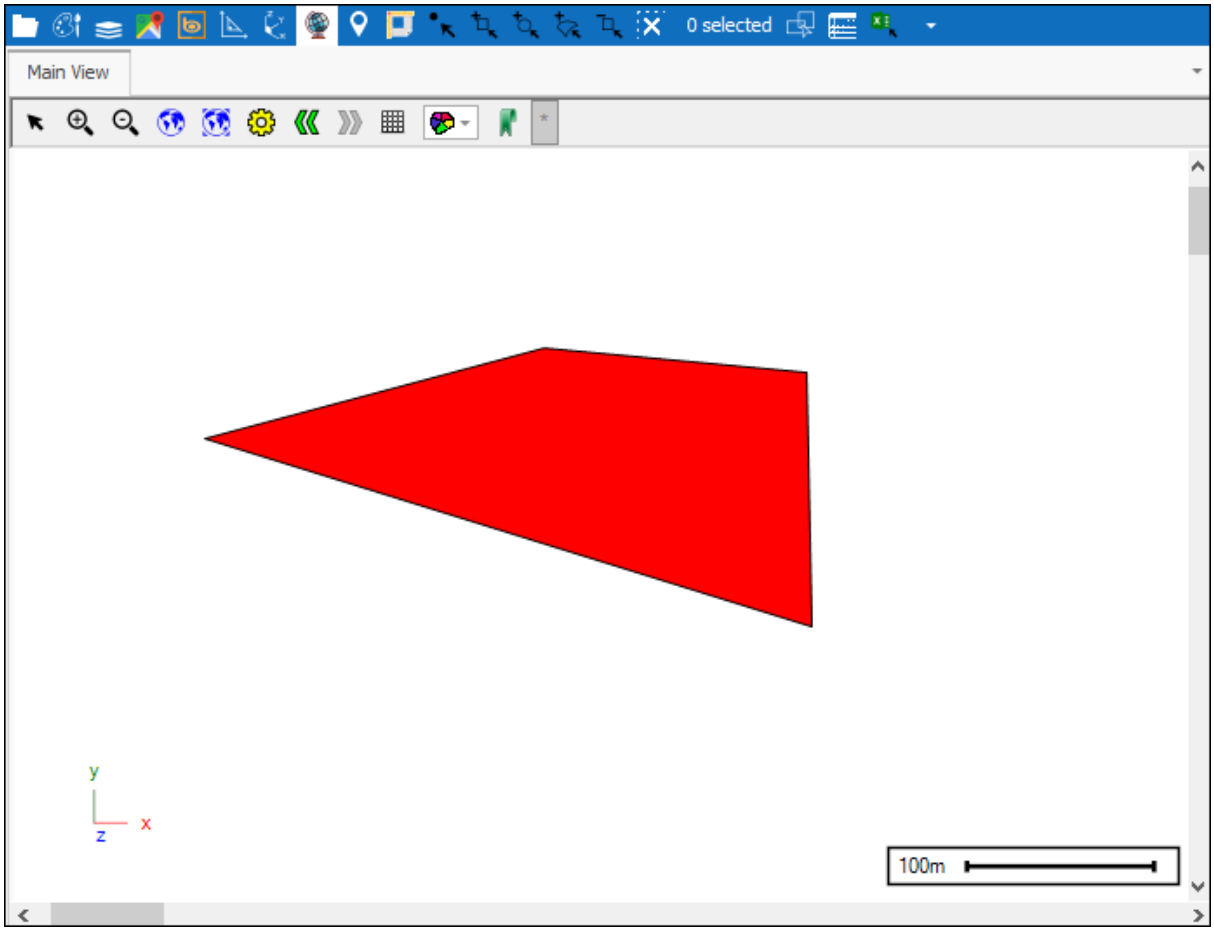

## Points to polygon



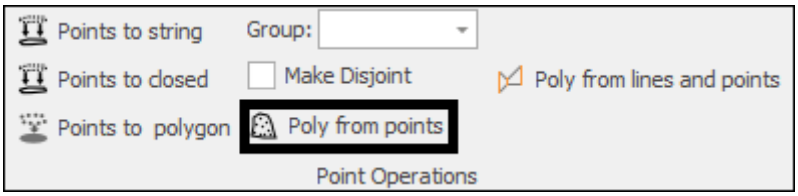

The **Points to polygon** tool will create a polygon from selected points (It will be drawn to any active layer). First select your points:



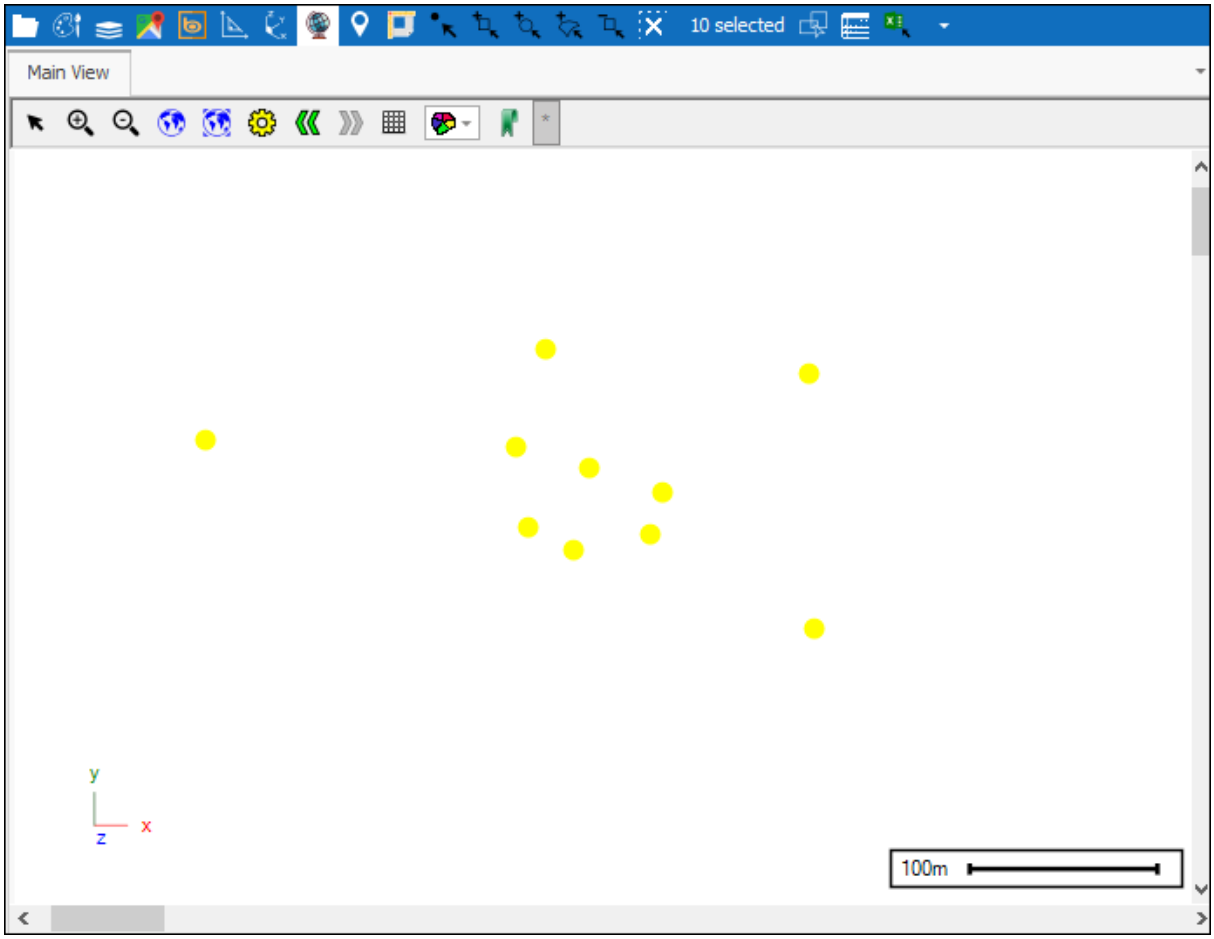

Then click the tool and the polygon has been created:



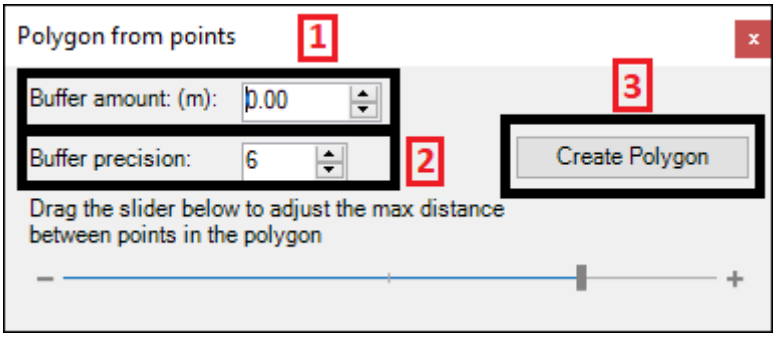

## Poly from points



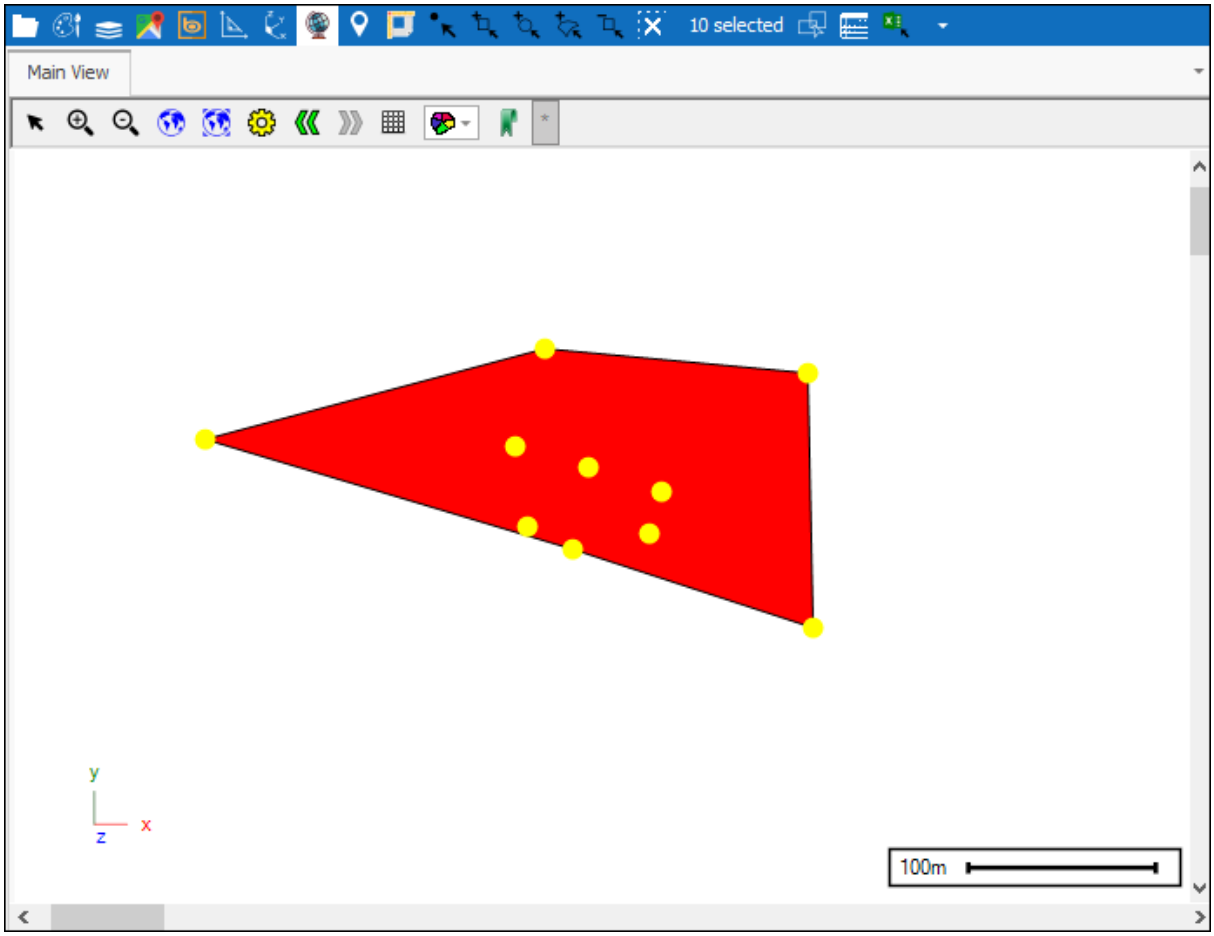

The **Poly from points** tool will create a bounding polygon of points (It will be drawn to any active layer). You can also optionally buffer result by given amount. First select your points:



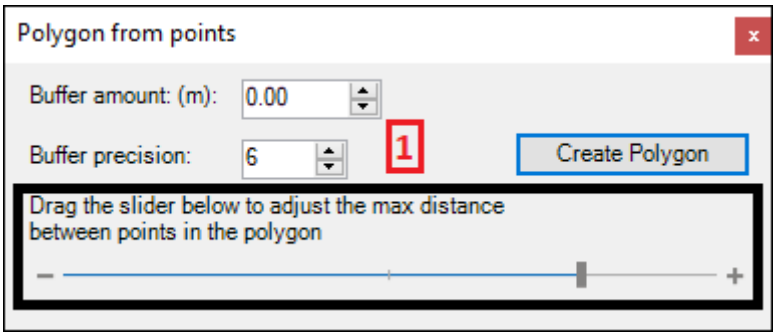

Then click on the tool which will bring up the following dialogue. **Buffer amount (m)**(1) is how much you would like to buffer the polygon by, leave at zero if you don't want to buffer it. **Buffer precision**(2) is how many points to use in buffering, a higher number of points means smoother buffering. In this first example I won't buffer. You can then click **Create Polygon**(3):

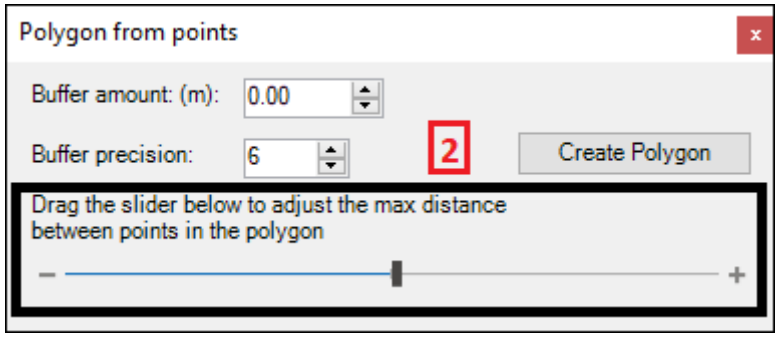


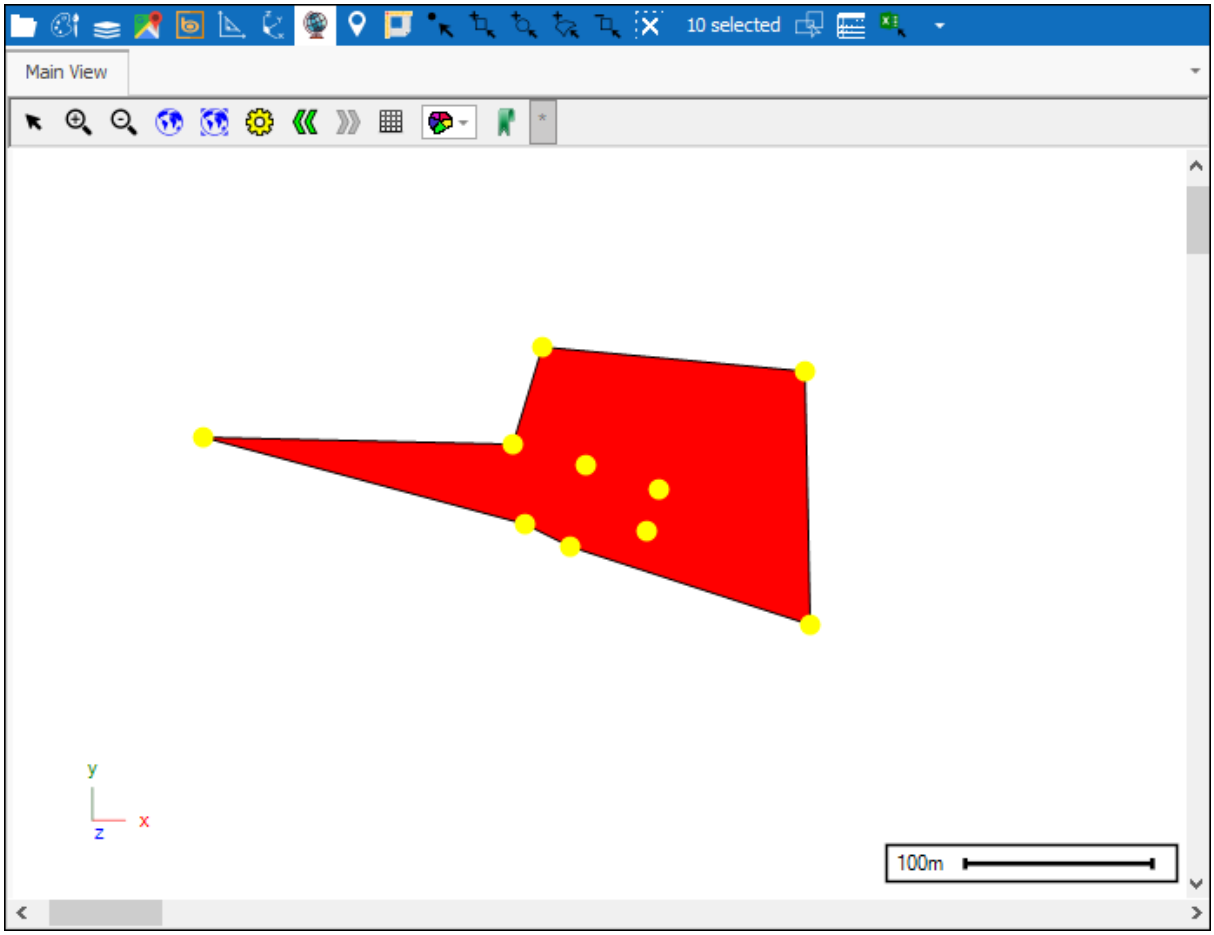

Your polygon has been created:



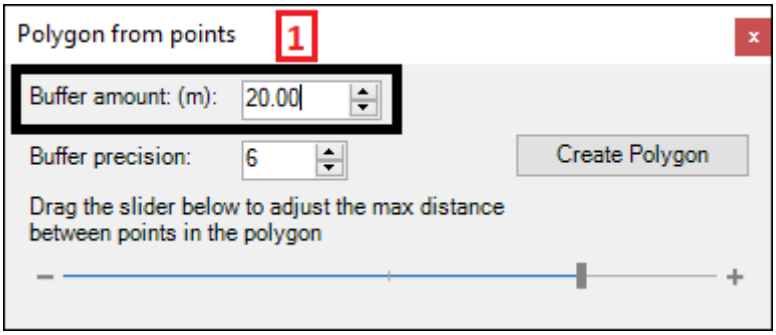

The slider below(1) can be used to adjust the maximum distance between points in the polygon. You can slide it back and forth(2) and the polygon will respond at the same time in your scene(3):

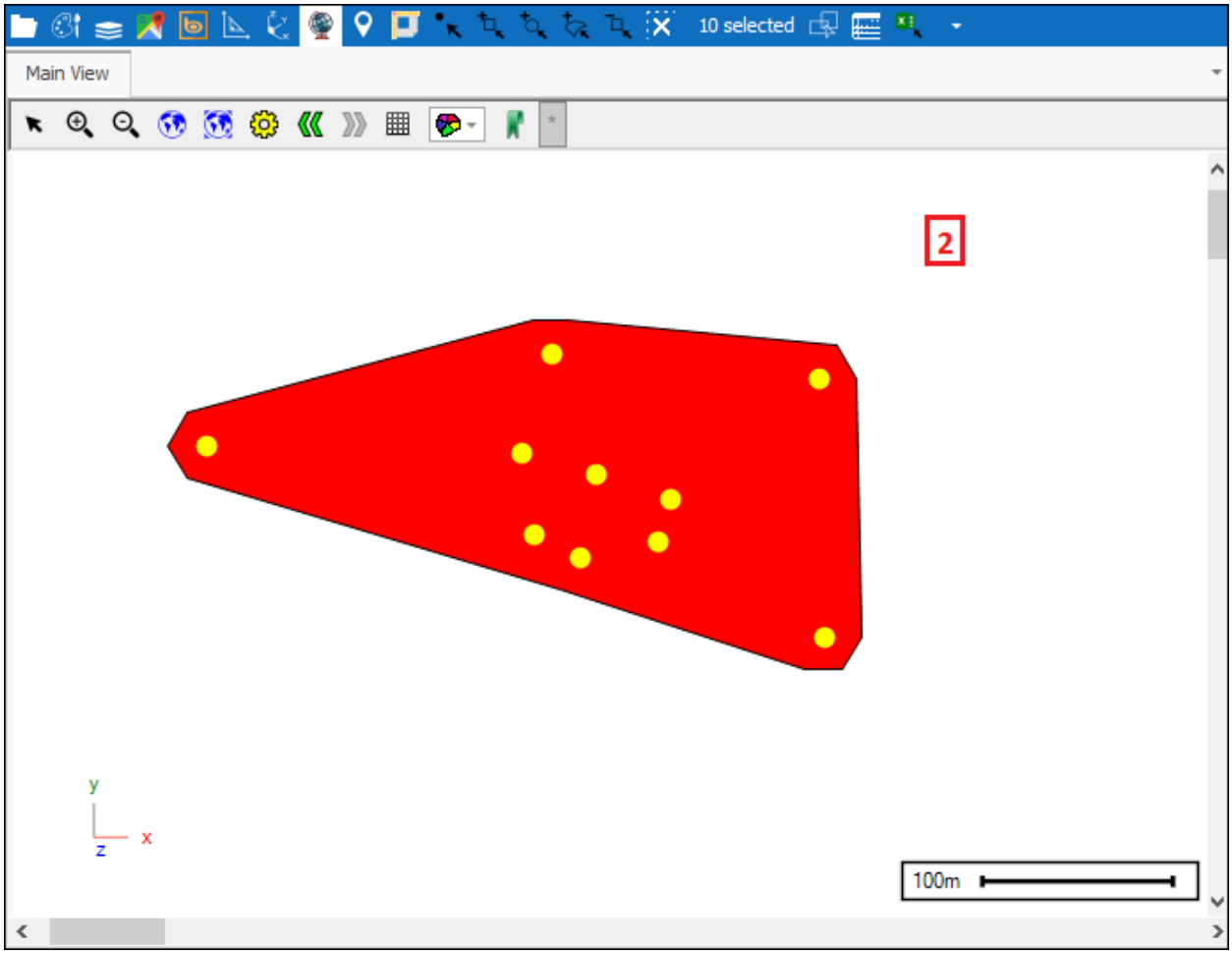




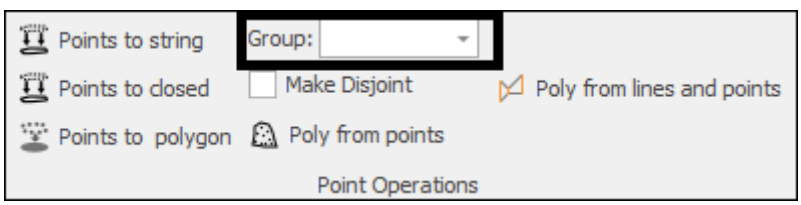




Now for the second example I will buffer the polygon by 20 metres when I'm creating it(1)(2):

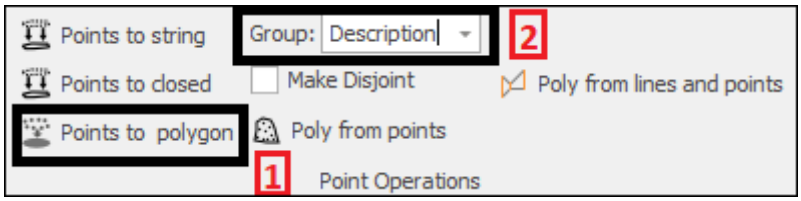

Polygon from points
1
Buffer amount: (m):
20.00
Buffer precision:
6
Create Polygon
Drag the slider below to adjust the max distance between points in the polygon

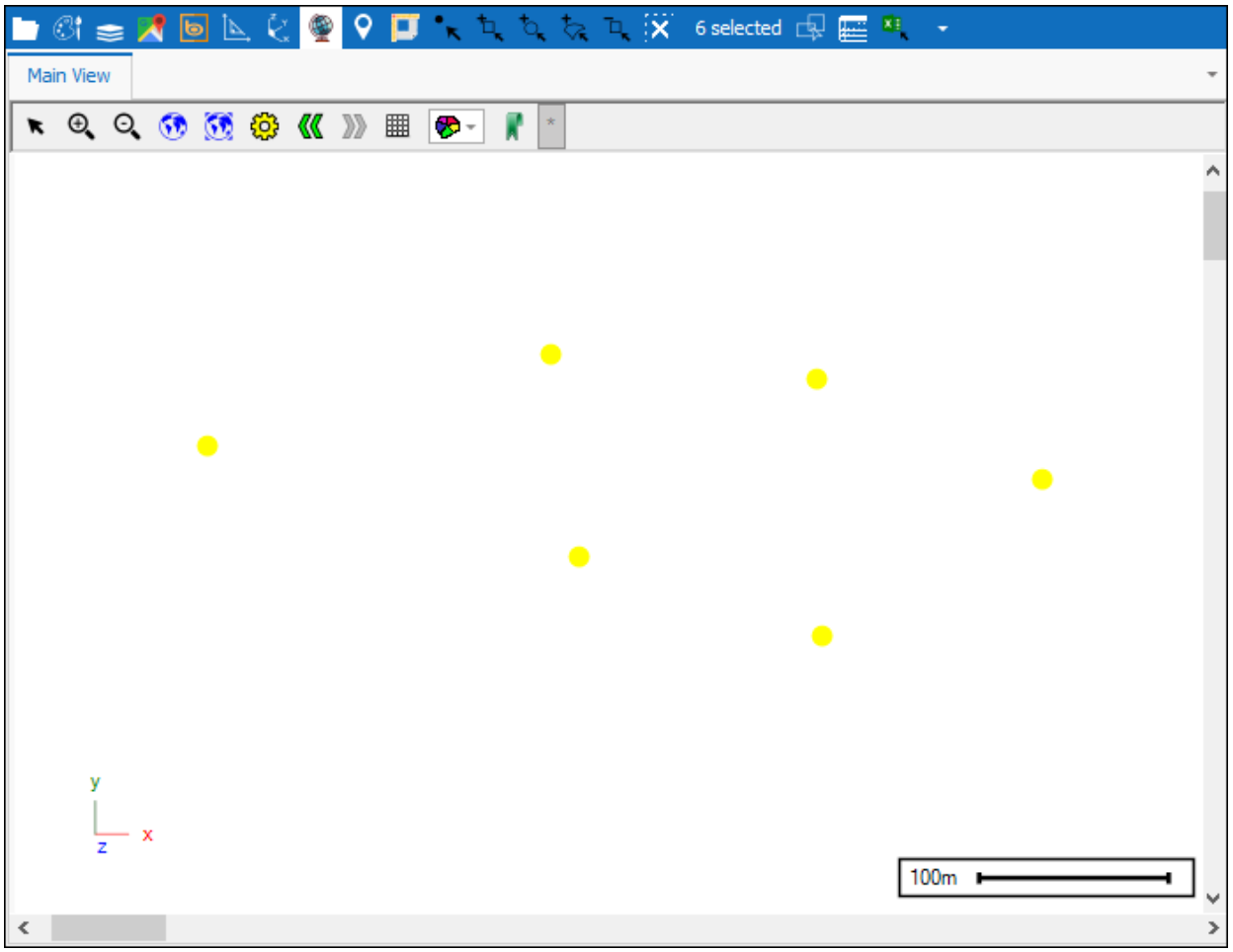

10 selected
Main View
2
y
x
z
100m

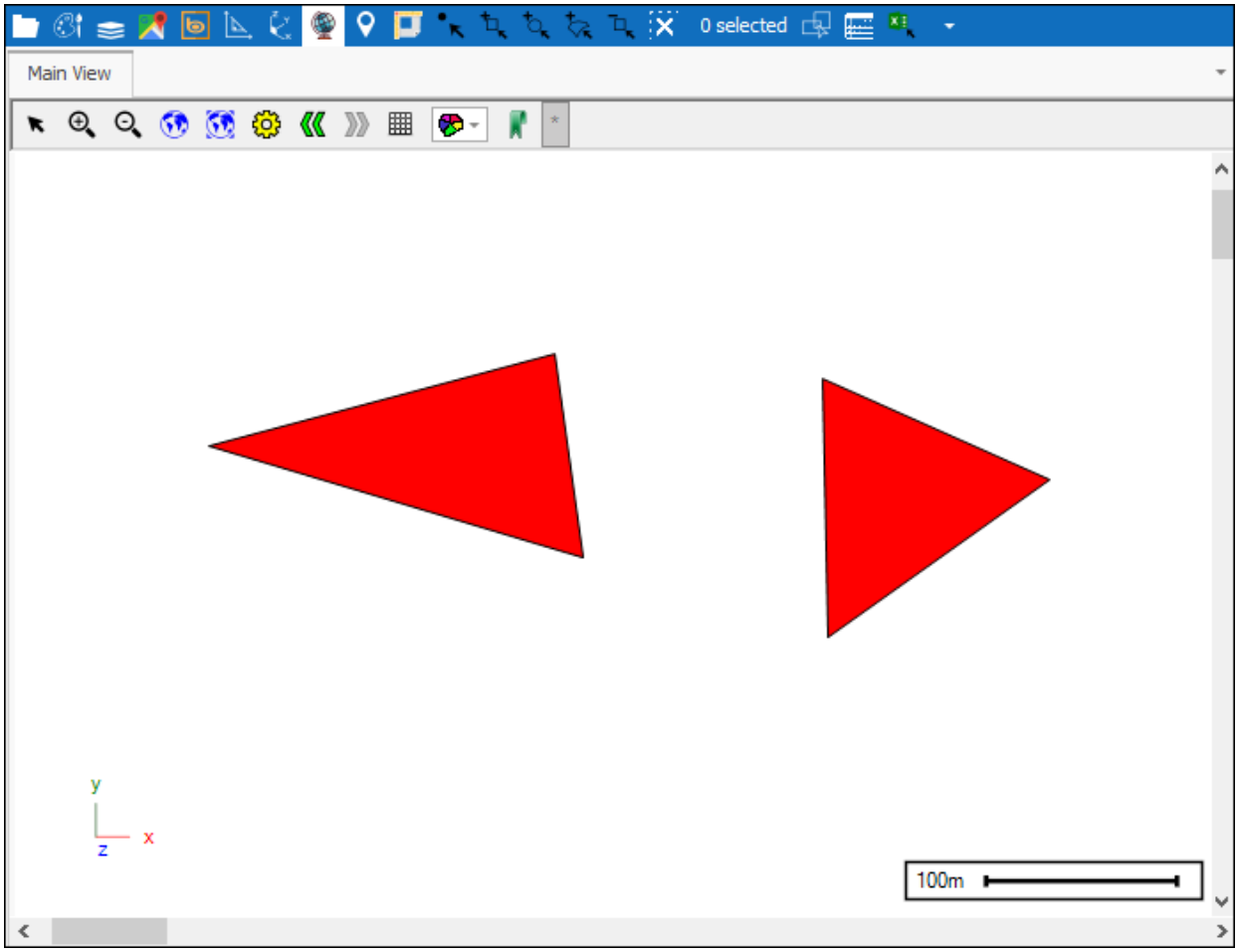
## Group


Points to string
Group:
Points to closed
Make Disjoint
Poly from lines and points
Points to polygon
Poly from points
Point Operations

The **Group** box can be used at any point to specify a column in your layer data that you would like to use to group points by when you are doing a point operation. As an example I will group by the Description column in my layer data when using the **Points to polygon**(1) operation, simply type the name of the column into the box(2):

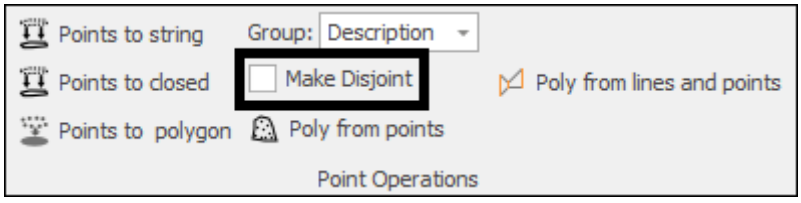


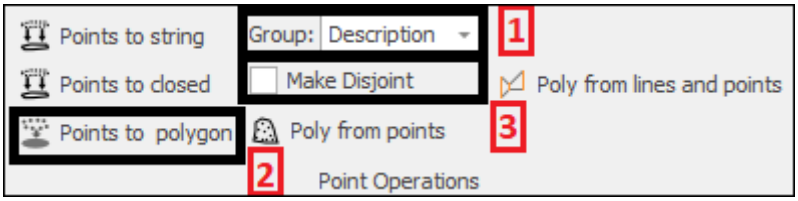


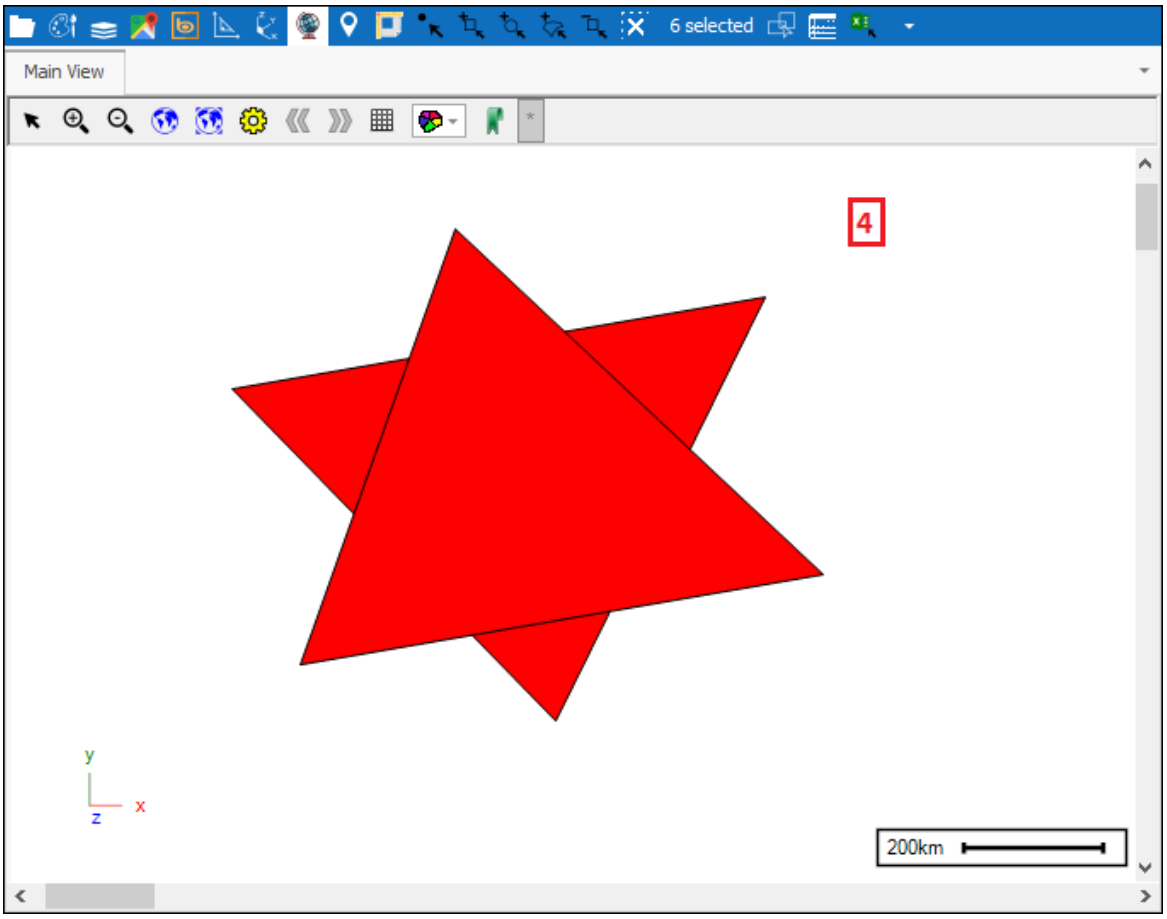

And as you can see it created two separate polygons from my points based on the grouping of points that I chose.

## Make Disjoint

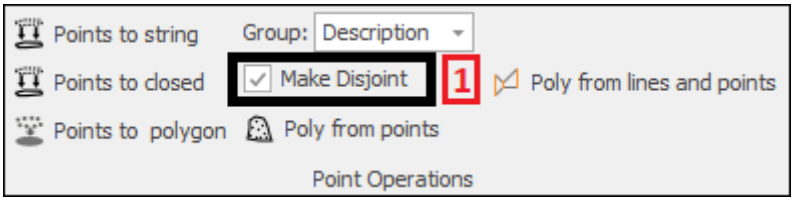


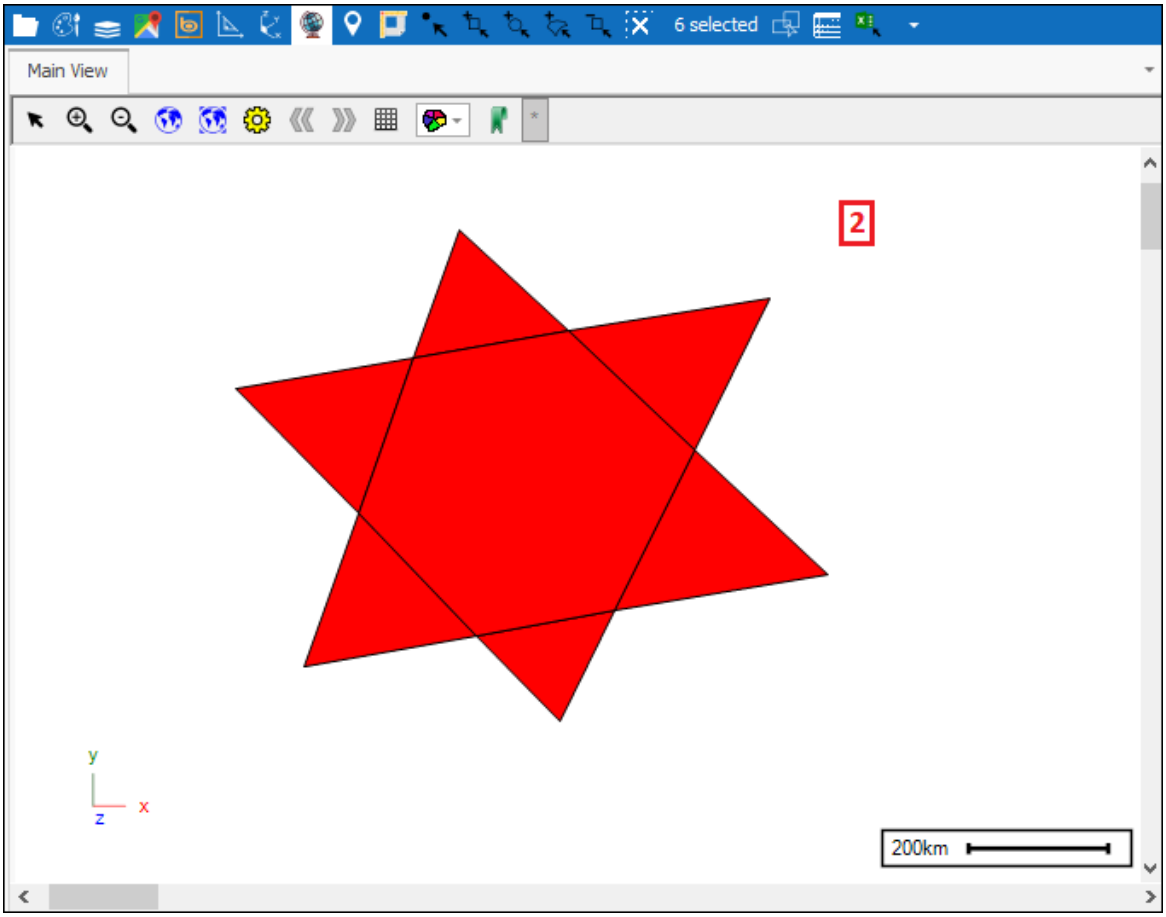

By ticking on **Make Disjoint** you ensure that any polygons created are disjoint and do not overlap. As an example, I have grouped my points by the Description column in my data(1) and I am going to do a **Points to polygon**(2) operation. If I do not tick this on(3) the polygons created would look like this(4):



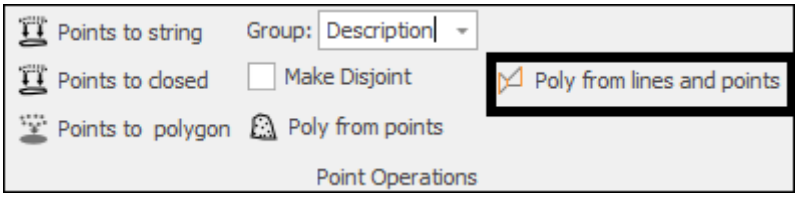




If, however, I tick this on(1) the polygons created will be made disjoint and will not overlap each other(2):

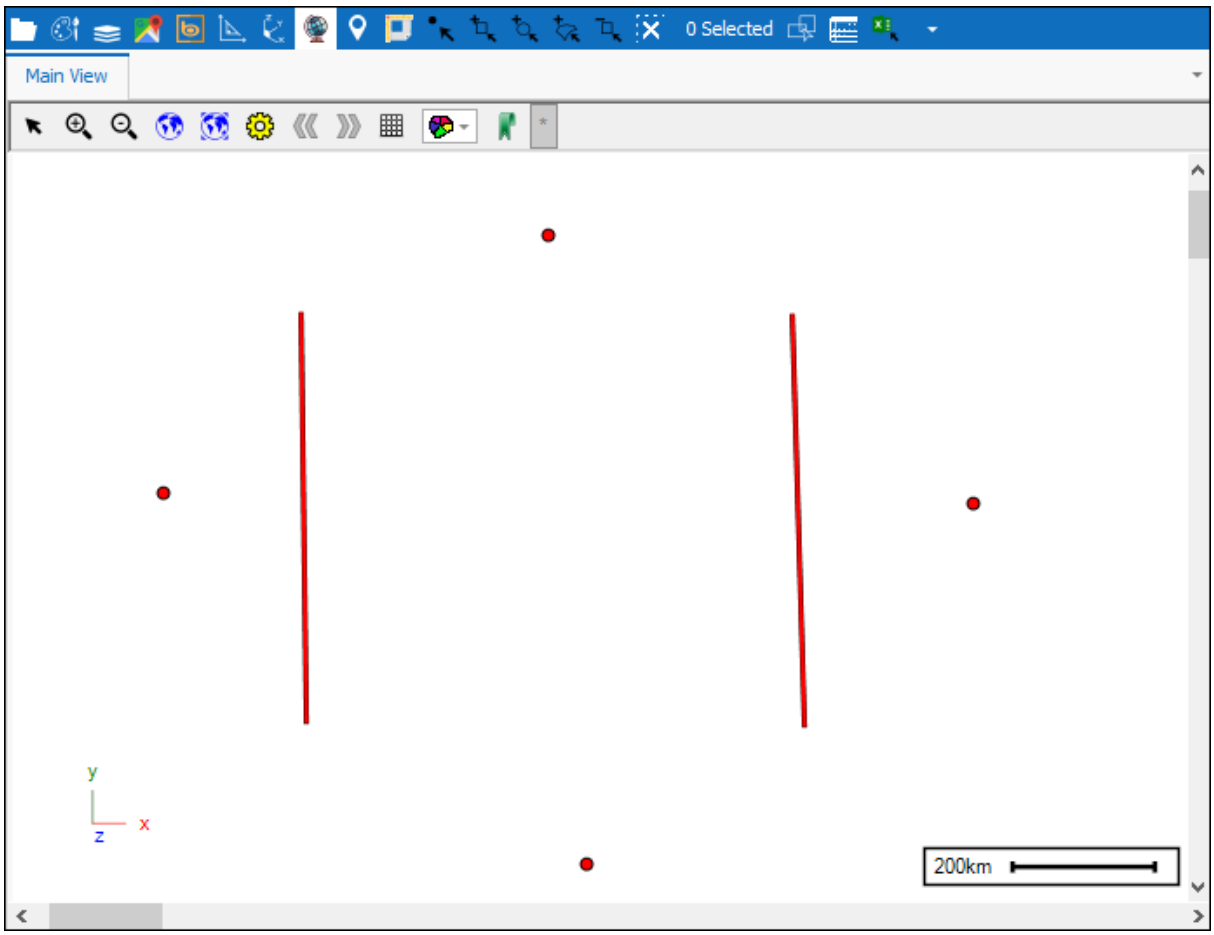




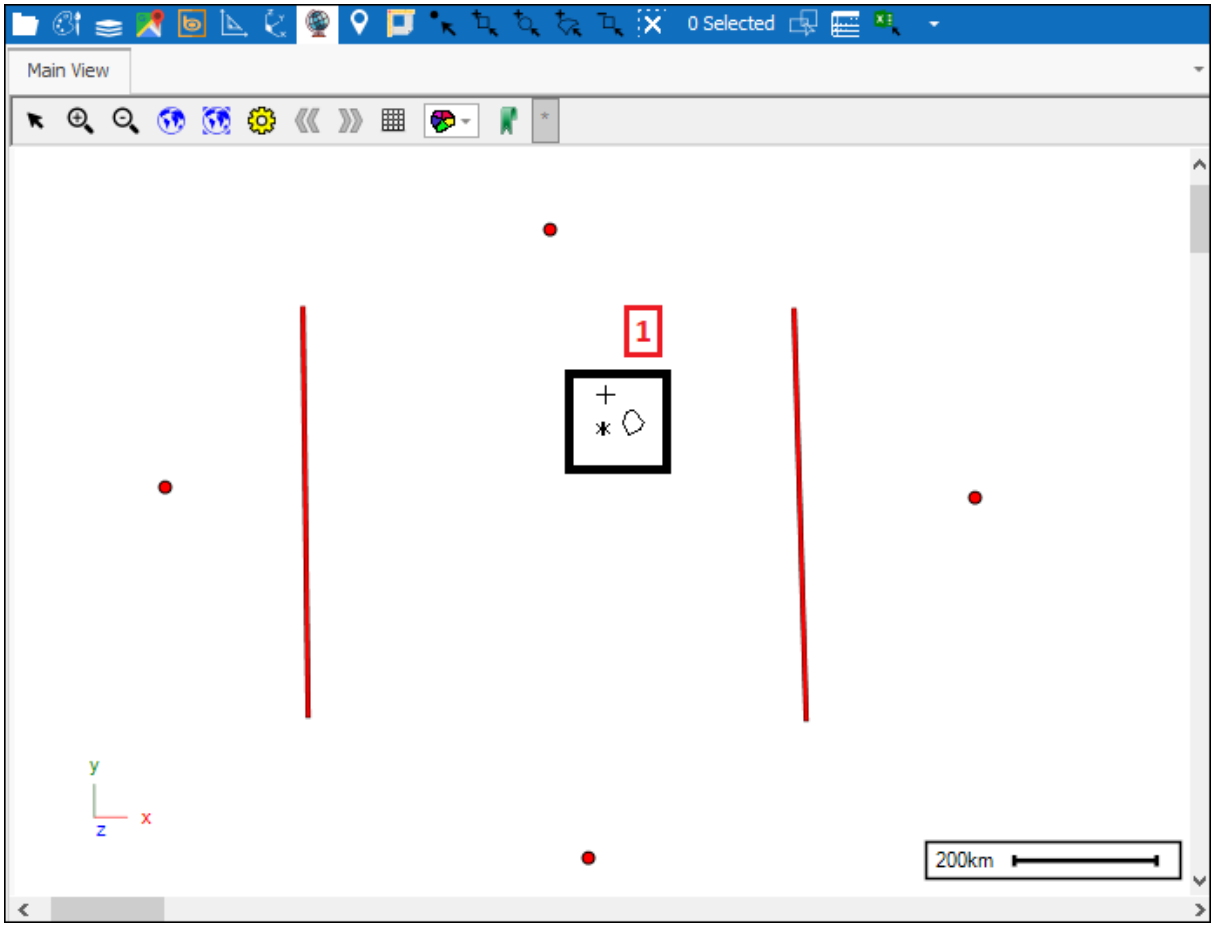

## Poly from lines and points

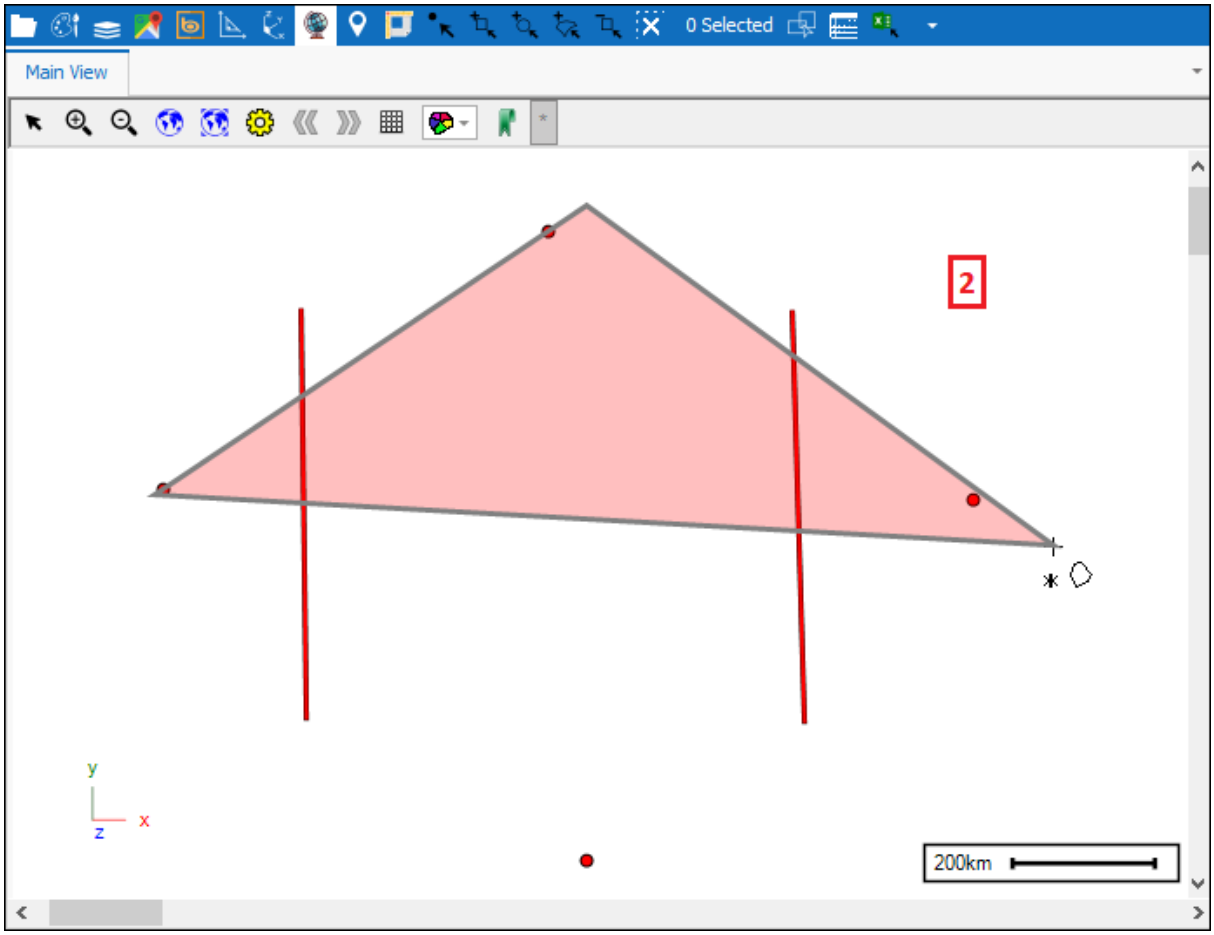



The **Poly from lines and points** tool allows you to make a polygon from points and intersecting lines(It will be drawn to any active layer). First you would have your points and lines in your scene:

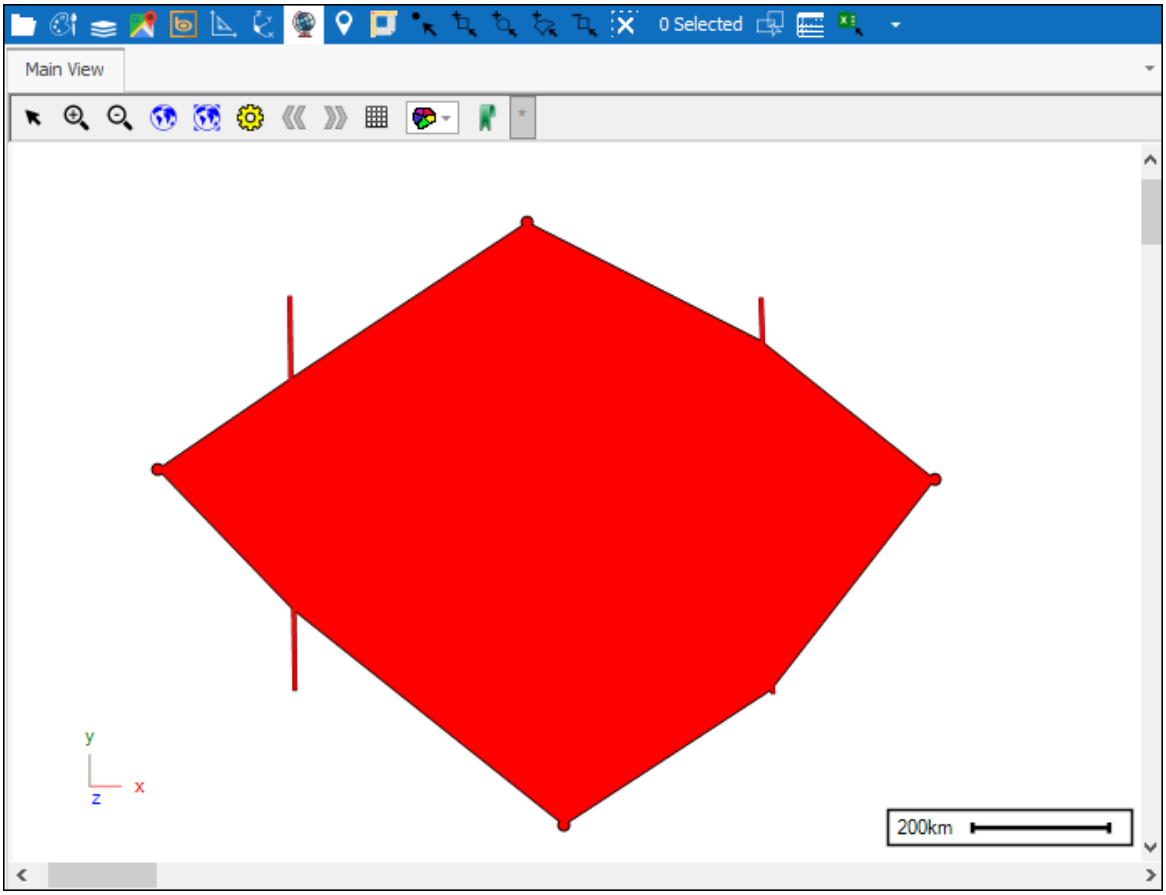



Then you would click on the tool and hover on your scene and you will see the polygon draw is active on the cursor(1). You can then start drawing the polygon covering your points and lines as desired(2):


0 Selected
Main View
1
y
x
z
200km




Double click when finished and as you can see my polygon has been created and it respects all the points and lines I covered:




## Support

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