1   Pseudo-Code: Bentley-Ottmann Algorithm

2   Initialize event queue **EQ** = all segment endpoints;

3   Sort **EQ** by increasing x and y;

4   Initialize sweep line **SL** to be empty;

5   Initialize output intersection list **IL** to be empty;

6

7   While (**EQ** is nonempty) {

8   Let E = the next event from **EQ**;

9   If (E is a left endpoint) {

10   Let segE = E's segment;

11   Add segE to **SL**;

12   Let segA = the segment Above segE in **SL**;

13   Let segB = the segment Below segE in **SL**;

14   If (I = Intersect(segE with segA) exists)

15   Insert I into **EQ**;

16   If (I = Intersect(segE with segB) exists)

17   Insert I into **EQ**;

18   }

19   Else If (E is a right endpoint) {

20   Let segE = E's segment;

21   Let segA = the segment Above segE in **SL**;

22   Let segB = the segment Below segE in **SL**;

23   Delete segE from **SL**;

24   If (I = Intersect(segA with segB) exists)

25   If (I is not in **EQ** already)

26   Insert I into **EQ**;

27   }

28   Else { // E is an intersection event

29   Add E's intersect point to the output list **IL**;

30   Let segE1 above segE2 be E's intersecting segments in **SL**;

31   Swap their positions so that segE2 is now above segE1;

32   Let segA = the segment above segE2 in **SL**;

33   Let segB = the segment below segE1 in **SL**;

```
34              If (I = Intersect(segE2 with segA) exists)
35                  If (I is not in EQ already)
36                      Insert I into EQ;
37              If (I = Intersect(segE1 with segB) exists)
38                  If (I is not in EQ already)
39                      Insert I into EQ;
40          }
41          remove E from EQ;
42      }
43      return IL;
44  }

45
```

3D structural model of the GTS

Fig. S1. 3D structural model of the GTS with faults grouped according to their strike

3D structural model using Delaunay triangulation

3D structural model using the ribbon tool

Fig. S3. 3D regional structural model with surface faults extrapolated using the ribbon tool

midland
valley

Created using

move™

3D structural model using field data

Fig. S4. 3D regional structural model with surface faults extrapolated using field data