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Estimation of 3D positions and orientations of reflectors identified during the stage 2 reflection seismic survey at Forsmark

Site descriptive modelling
Forsmark Stage 2.1

Calin Cosma, Lucian Balu, Nicoleta Enescu

Vibrometric

October 2006

SKB

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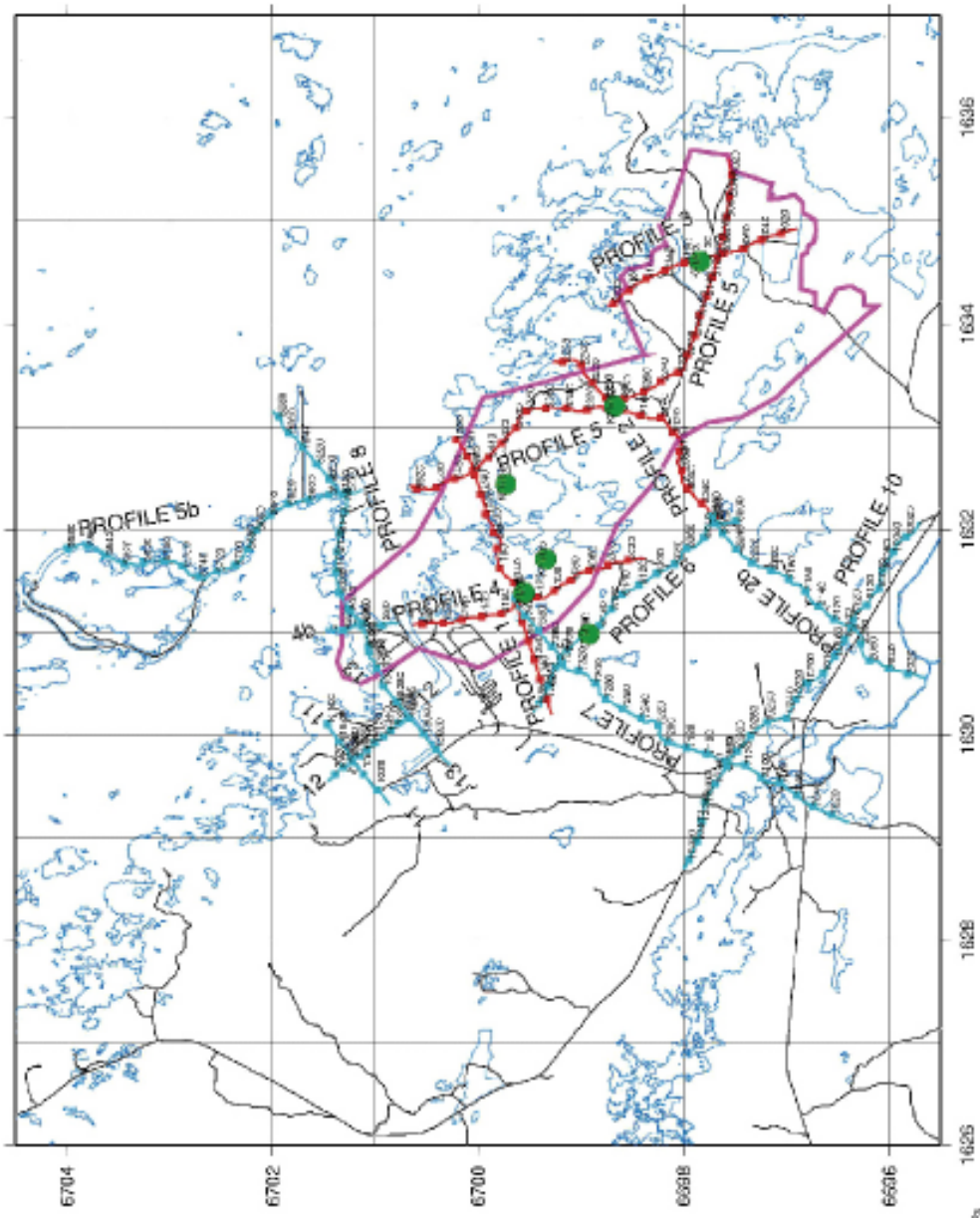Vibrometric

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Contents

1   Introduction

Stage 2 reflection seismic surveys were performed in the autumn of 2004 in the Forsmark area. High-resolution seismic data were acquired along ten profiles (Figure 1-1). Eighteen reflectors were interpreted by /Juhlin and Palm 2005/ and are listed in Table 1-1.

The data from the ten 2D reflection profiles, together with the interpretation given by /Juhlin and Palm 2005/ (Table 1-1), represent the input data for the estimation of 3D positions and orientations of reflectors identified from the Stage 2 reflection seismic data by Vibrometric.

Table 1-1. Orientation of reflectors from Stage 2, as determined by /Juhlin and Palm 2005/. The profiles measured in Stage 2 are marked with bold. The other profiles were measured in Stage 1 and support the given orientations. The distance is measured from the arbitrary origin (6699 km N, 1633 km W) to the closest point on the reflector at the surface. Depth is measured from surface below this origin. Strike is measured clockwise from North. Rank indicates how sure the observation of each reflection is on the profiles on which the reflection is observed, 1 = definite, 2 = probable, 3 = possible.

Reflector	Strike	Dip	Distance (m)	Depth (m)	Rank	Profiles observed on
A1	75	45	3,100		2	1, 2, **2b**, 3, 4, **4b, 5, 5b?, 6, 7, 8, 10**
A2	80	22	790		2	2, 4, 5, **6, 7**
B8	15	22	4,400		1	**11, 12, 13**
B9	355	38	3,150		2	**4b?, 11, 12, 13**
C1	15	20		3,300	1	1, 2, **2b**, 3, 4, **4b**, 5, **5b?, 6, 7, 8, 10**
C2	355	10		3,300	1	1, 2, **2b**, 3, 4, **4b**, 5, **5b?, 6, 7, 8, 10**
G5	100	12		200	3	**2b, 6, 10**
G6	100	12		550	3	**2b, 6, 10**
G7	100	12		400	3	**6, 10**
J1	115	48	−1,050		1	**2b, 10**
J2	100	37	−150		1	**7, 10**
J3	90	70	−1,500		2	**2b, 10**
K1	50	40	2,800		1	**7, 10**
L1	255	7	−400		2	**4b, 8**
L2	255	7	−1,600		2	**4b, 8**
M1	80	11	6,900		2	**5b, 8**
M2	80	11	10,900		2	**5b, 8**

Figure 1-1. *Stage 2 profiles acquired in 2004 are shown as light blue lines. Station locations for profiles acquired in 2002 (Stage 1) are shown with red lines. Green circles are the deep boreholes available at the time when the Stage 2 data were acquired (after /Juhlin and Palm 2005/).*

2   Objectives

The main objective of this study was to compute the extent of the reflector elements for the reflectors interpreted in /Juhlin and Palm 2005/, within the coverage offered by the measured profiles, and to place these elements in 3D space.

The first task was to confine the infinite reflection planes defined in Table 1-1 to reflector elements (rectangles) where reflections actually occur. The planar reflecting elements have a length determined by the length of the observable reflection pattern, on the seismic section, and a transverse dimension of 100 m, which corresponds roughly to 3–4 signal wavelengths.

The second task of the present exercise was to compute the orientations and extent of the reflectors that could be identified in the seismic profiles. For those which were not easy to approximate with planar elements, a piece-wise linear approximation was suggested, using a sequence of articulated planar elements with slightly different orientations.

3 Survey layout

The profile naming convention is given in Figure 1-1 and Figure 3-1. For all the profiles with significant deviation from linearity, the position of each bending point has been determined, as shown in Figure 3-1 and is given in Table 3-1.

Table 3-1. Profiles with deviation from linearity. The positioning of the bending points, relative to the first station of each profile is provided.

Profile	1st bending point (station)	2nd bending point (station)
6	43	440
7	172	425
8	102	420
10	625	–
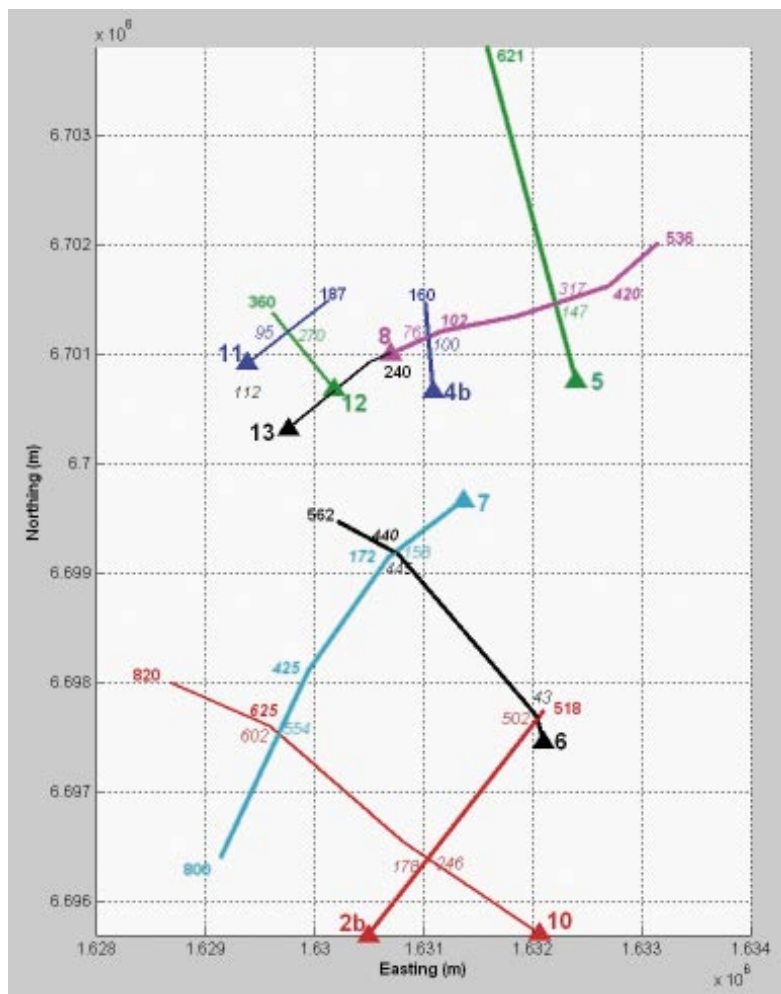
Figure 3-1. *Stage 2 reflection lines, with the line number marked in bold face near the triangle, which shows the beginning of the line. The location of the bending points (Table 3-1) is given in bold italic face, while the station numbers of the intersections between two lines are given in italic face, using the same colour as the line.*

4 The crux point method applied on bent profiles

For some of the profiles, the CDP coordinates have significant deviations from linearity. If not taken into consideration, this would lead to errors in the positioning of the 3D reflection elements. The crux point method applied to straight acquisition lines has been described in /Cosma et al. 2003/.

With the Stage 1 reflection data, two of the profiles were split into five linear sub-profiles for the interpretation to be carried out correctly. The interpretation became somewhat difficult, having to operate with more profiles than originally envisaged.

With the Stage 2 reflection data, the number of profiles with "bending" points was significantly higher, so a manual split of the profiles became prohibitive. The entire process of profile splitting, and related calculations for the interpreted reflectors, was therefore implemented as an automatic procedure. The interpreter identifies the bending points for appropriate profiles, as exemplified in Figure 4-1, and carries out the interpretation for both straight and bent profiles in a transparent, yet correct, manner.

Figure 4-2 exemplifies the difference between reflector calculations carried out for a bent reflection line that is approximated with one straight line, traced between the first and the last station, or piece-wise linearly, with a series of straight lines. The difference becomes apparent when inspecting how well does the calculated reflector line match the reflected pattern in the measured data.

As a result, all calculations of the 3D reflection elements are completed independently, on sub-profiles. The projection of each sub-profile on the reflection plane has different coordinates compared with the projection of a straight line between the first station and the last station.
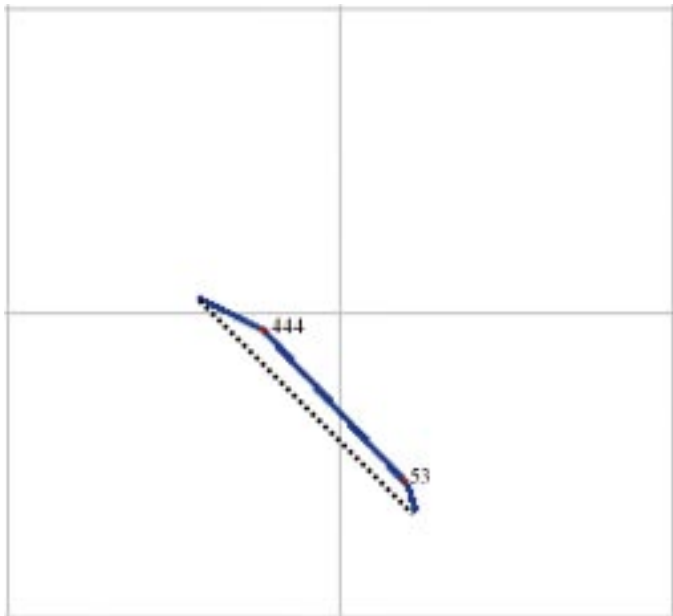
Figure 4-1. *Profile 6 (blue line) deviates from a straight line that has been traced between the first and last stations of the profile. Two bending points were identified for this profile, at stations 53 and 444.*
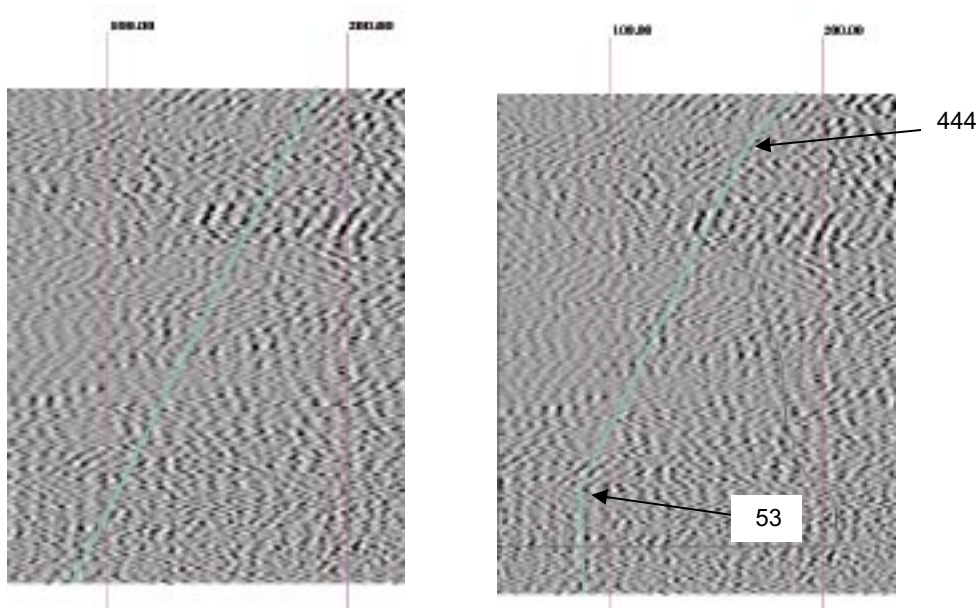
Figure 4-2. *Example of a reflector (shown with green line) interpreted on profile 6: (left) the reflector is calculated using the crux point method for a straight line that approximates profile 6 and (right) the reflector is calculated using the crux point method for a bent line that approximates profile 6. The bending points were identified as shown in Figure 3-1 and are marked with black arrows on the right side profile.*

From one 2D profile, it is possible to determine only two out of three parameters that are necessary for the 3D spatial definition of a reflector. If the structure that generated the reflection extends in space enough to be visible from several 2D profiles, it is possible to determine its 3D position and orientation as the plane segment that would simultaneously fit the reflection events in the profiles where the structure is visible. Figure 4-3 shows one example of geometrical ambiguity in determining the orientation of one reflector based only on information that can be retrieved from one profile. For a straight profile, for a reflector for which only the dip and the distance (see Table 1-1) are determined, the geometrical locus of possible locations of the reflector elements due to 360° strike ambiguity is a section of a cone centered along the profile line.
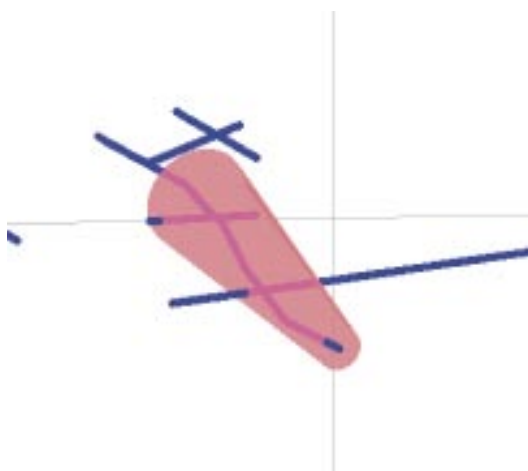
Figure 4-3. *In case of a straight profile, the geometrical locus of possible locations of a reflector element due to 360° strike ambiguity in determining its 3D location is a section of a cone (red) centered along the profile line (blue).*

For bent profiles, orienting an interpreted reflector becomes a simpler task, since one main event may be identified in one sub-profile (originator) and propagated to the other sub-profiles using the crux point method /Cosma et al. 2005/. The interpreted reflector will not modify its position on the originator sub-profile when varying its strike but it will modify its time mark on the other sub-profiles. This process is illustrated in Figure 4-4, which displays the time marks and the location in space for one reflector, if it were to have two different strike directions.

In the example above, the red reflector is a better choice, since it matches correctly the data.
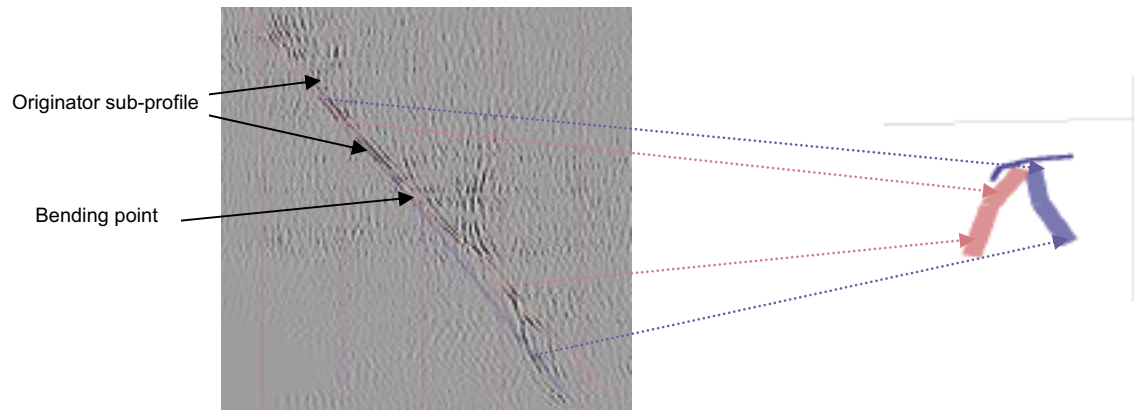
Figure 4-4. *Interpretation of the orientation of one reflector on a bent profile. Left: time marks for the same reflector, if it were to have different orientations. On the originator sub-profile the red and blue lines coincide, while on the lower sub-profile the difference in orientation translates in different time curves. Right: top view of possible locations in space of the reflector interpreted at two different strikes on the profile shown on the left side.*

5   Results

Reflector elements have been computed for all reflectors identified in /Juhlin and Palm 2005/. In addition to these, elements for reflector A0 /Juhlin et al. 2002/ and /Cosma et al. 2003/ and reflectors B8 curved and L1 curved were also computed. All reflector elements determined within the present study are shown in Figure 5-1, Figure 5-2 and Figure 5-3. Table 5-1 presents the parameters of Stage 2 reflectors for which 3D elements were calculated (Stage 2 profiles in bold). The other profiles are reported in /Cosma et al. 2003/ and support the Stage 2 orientations. Stage 2 profiles not included in Table 1-1, but where additional support for the given reflector orientations was found in this study, were also left out of Table 5-1. These profiles are however listed in bold in Table 5-2.
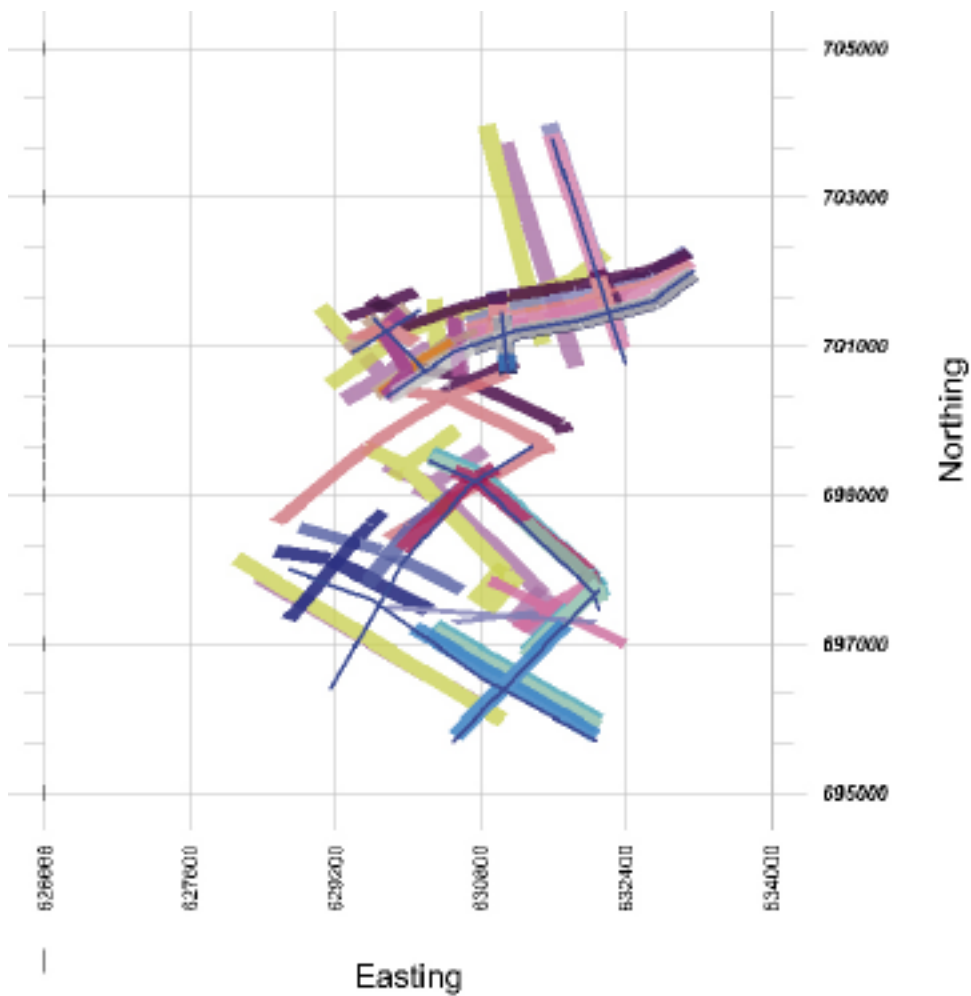
Figure 5-1. *Top view of all computed 3D reflector elements.*
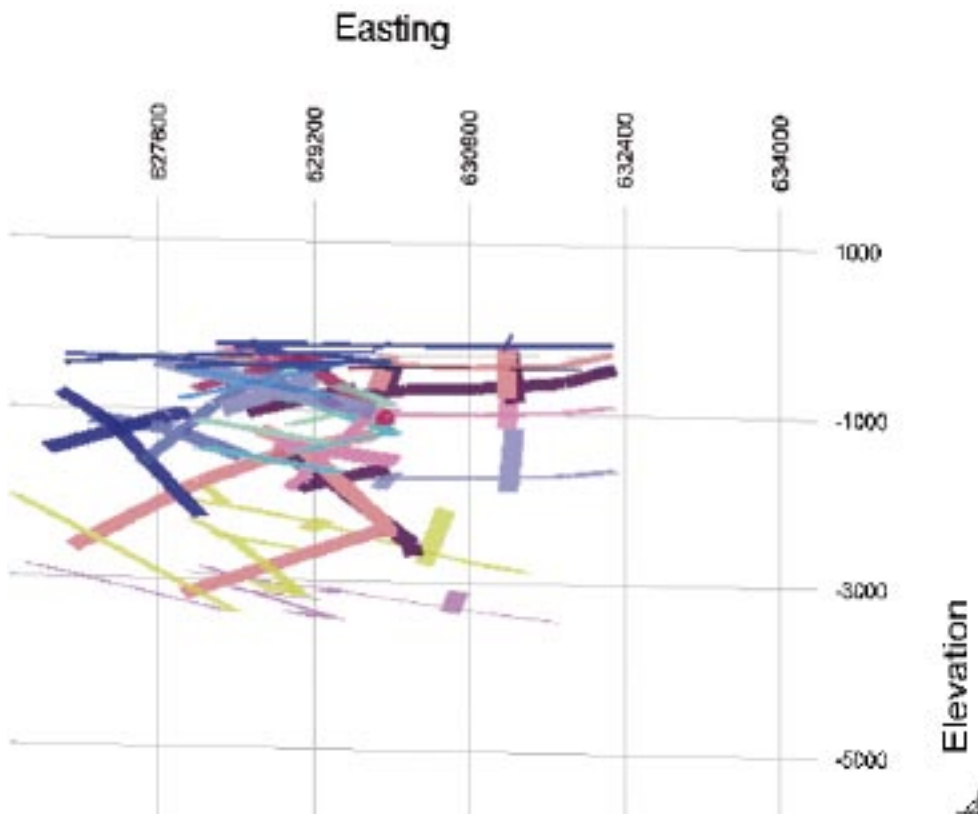
Figure 5-2. *3D view, from south, of all computed 3D reflector elements.*
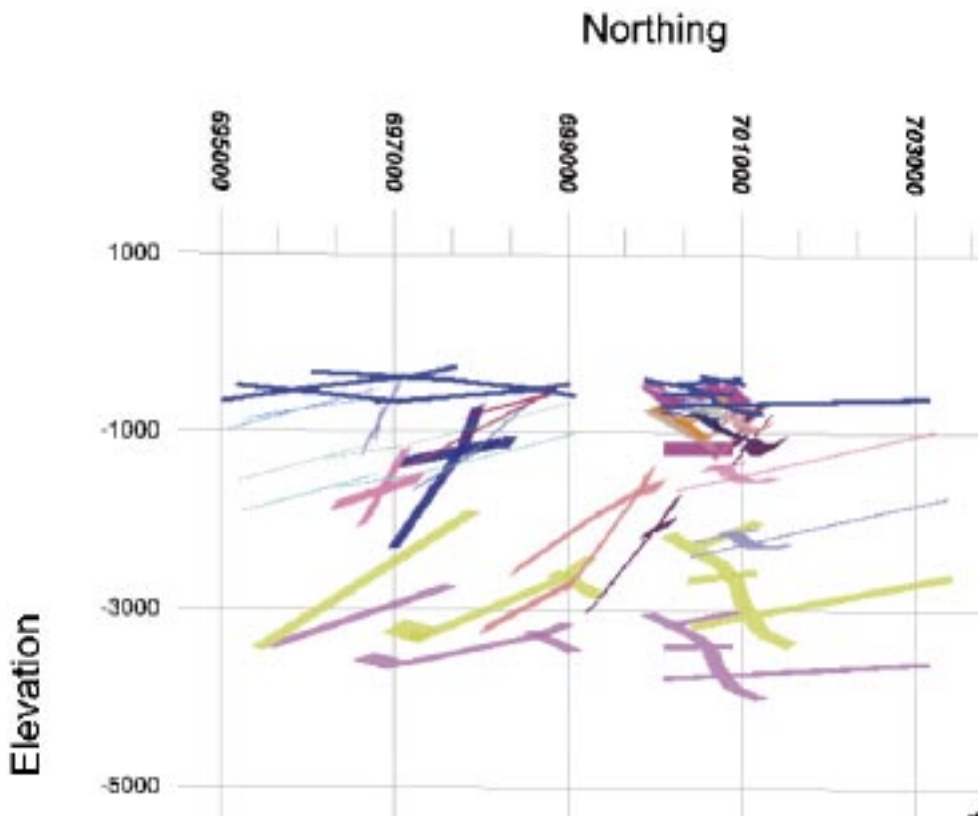
Figure 5-3. *3D view, from east, of all computed 3D reflector elements.*

Table 5-1. Reflectors interpreted from Stage 2 surface seismic data for which 3D elements were calculated in this study (profiles marked with bold). The other profiles are reported in /Cosma et al. 2003/ and support the Stage 2 orientations. The distance is measured from the arbitrary origin (6699 km N, 1633 km W) to the closest point on the reflector at the surface. Depth is measured from surface below this origin. Strike is measured clockwise from North. Rank indicates how sure the observation of each reflection is on the profiles on which the reflection is observed, 1 = definite, 2 = probable, 3 = possible.

Reflector	Strike	Dip	Distance (m)	Depth (m)	Rank	Profiles observed on
A1	75	45	3,100		2	1, 2, **2b**, 3, 4, **4b**, 5, **5b**, **6**, **7**, **8**, 10
A2	80	22	790		1	2, 4, 5, **6**, **7**
B8	15	22	4,400		1	**11, 12, 13**
B9	355	38	3,150		2	**4b, 11, 12, 13**
C1	15	20		3,300	1	1, 2, **2b**, 3, 4, **4b**, 5, **5b**, **6**, **7**, **8**, 10
C2	355	10		3,300	1	1, 2, **2b**, 3, 4, **4b**, 5, **5b**, **6**, **7**, **8**, 10
G5	100	12		200	3	**2b, 6, 10**
G6	100	12		550	3	**2b, 6, 10**
G7	100	12		400	3	**6, 10**
J1	115	48	−1,050		1	**2b, 10**
J2	100	37	−150		1	**7, 10**
J3	90	70	−1,500		2	**2b, 10**
K1	50	40	2,800		1	**7, 10**
L1	255	7	−400		2	**4b, 8**
L2	255	7	−1,600		2	**4b, 8**
M1	80	11	6,900		2	**5b, 8**
M2	80	11	10,900		2	**5b, 8**
A0 (marked on interpreted profiles)						**4b, 5b, 6, 7, 8, 11, 12, 13**

Table 5-2. Reflectors interpreted from Stage 2 surface seismic data for which 3D elements were calculated in this study. Reflector label is followed by a reflector number, which corresponds to labels shown on the profiles displayed in the appendix. The visibility mark is 1 for weak reflection patterns and 2 for strong ones. The strike is measured clockwise from north and the dip is measured from horizontal (0), by the right hand rule. Northing, Easting and Depth give the coordinates of the Crux Point associated with the reflector. The origin chosen for interpretation was (6699 km N, 1633 km W). First and last stations mark the beginning and the end of the zone where the reflected pattern is visible on the measured profile.

Reflector (label)	Visibility	Strike	Dip	Northing (m) +6000000	Easting (m) +1000000	Depth (m)	Profile	First station	Last station
A1									
1	1	75.0	45.0	701992	632189	0	L02b	1	518
1	1	75.0	45.0	702038	630721	395	L04b	1	160
1	1	75.0	45.0	701992	632189	0	L05b	1	230
1	2	75.0	45.0	701992	632189	0	L06	1	562
1	2	75.0	45.0	701992	632189	0	L07	1	800
1	1	75.0	45.0	701992	632189	0	L08	1	536
1	1	75.0	45.0	701992	632189	0	**L11**	1	100
1	1	75.0	45.0	701992	632189	0	**L12**	1	300

Reflector (label)	Visibility	Strike	Dip	Northing (m) +6000000	Easting (m) +1000000	Depth (m)	Profile	First station	Last station
A2									
2	**2**	80.0	22.0	699778	632860	0	L06	1	500
2	**1**	80.0	22.0	699778	632860	0	L07	100	424
B8									
15	**2**	15.0	22.0	700128	628747	0	**L08**	1	70
15	**2**	15.0	22.0	700128	628747	0	L11	1	187
15	**2**	15.0	22.0	700128	628747	0	L12	1	360
15	**2**	15.0	22.0	700128	628747	0	L13	1	240
B8 curved									
55	**2**	11.4	23.0	701001	628973	0	L11	6	47
55	**2**	42.9	18.0	701414	628858	0	L11	49	102
55	**2**	6.2	24.9	700942	629160	0	L11	106	186
55	**2**	0.7	16.8	700557	639445	−3,300	L12	11	116
55	**2**	26.8	29.6	698554	634385	−3,300	L12	118	217
55	**2**	358.9	16.4	700861	639991	−3,300	L12	220	250
55	**2**	353.4	15.4	701892	640676	−3,300	L12	270	290
55	**2**	21.6	25.4	698583	635466	−3,300	L12	305	358
55	**2**	35.8	18.3	700960	628875	0	L13	1	53
55	**2**	4.1	25.9	700364	629136	0	L13	58	87
55	**2**	20.1	20.7	700650	628860	0	L13	90	150
55	**2**	9.2	23.8	700431	629076	0	L13	154	240
B9									
16	**2**	355.0	38.0	698718	629863	0	L04b	1	160
16	**2**	355.0	38.0	698718	629863	0	L11	100	187
16	**2**	355.0	38.0	698718	629863	0	L12	1	250
16	**2**	355.0	38.0	698718	629863	0	L13	1	130
C1									
17	**1**	15.0	20.0	699000	633000	−3,300	L02b	400	518
17	**2**	15.0	20.0	699000	633000	−3,300	L04b	1	160
17	**2**	15.0	20.0	699000	633000	−3,300	L05b	1	621
17	**2**	15.0	20.0	699000	633000	−3,300	L06	1	562
17	**2**	15.0	20.0	699000	633000	−3,300	L07	1	200
17	**2**	15.0	20.0	699000	633000	−3,300	L08	1	536
17	**1**	15.0	20.0	699000	633000	−3,300	L10	1	820
17	**1**	15.0	20.0	699000	633000	−3,300	**L12**	1	360
17	**2**	15.0	20.0	699000	633000	−3,300	**L13**	1	240
C2									
18	**1**	355.0	10.0	699000	633000	−3,300	L02b	400	518
18	**2**	355.0	10.0	699000	633000	−3,300	L04b	1	160
18	**2**	355.0	10.0	699000	633000	−3,300	L05b	1	621
18	**2**	355.0	10.0	699000	633000	−3,300	L06	1	562
18	**2**	355.0	10.0	699000	633000	−3,300	L07	1	200
18	**2**	355.0	10.0	699000	633000	−3,300	L08	1	536

Reflector (label)	Visibility	Strike	Dip	Northing (m) +6000000	Easting (m) +1000000	Depth (m)	Profile	First station	Last station
18	2	355.0	10.0	699000	633000	−3,300	L10	150	800
18	2	355.0	10.0	699000	633000	−3,300	**L12**	1	360
18	2	355.0	10.0	699000	633000	−3,300	**L13**	1	240
G5									
25	2	100.0	12.0	699000	633000	−200	L02b	250	518
25	2	100.0	12.0	699000	633000	−200	L06	1	562
25	2	100.0	12.0	699000	633000	−200	L10	1	450
G6									
26	2	100.0	12.0	699000	633000	−550	L02b	250	518
26	2	100.0	12.0	699000	633000	−550	L06	1	562
26	2	100.0	12.0	699000	633000	−550	L10	1	450
G7									
27	1	100.0	12.0	699000	633000	400	**L02b**	100	400
27	2	100.0	12.0	699000	633000	400	L10	1	500
J1									
31	2	115.0	48.0	698048	632556	0	L02b	1	400
31	2	115.0	48.0	698048	632556	0	L10	50	400
J2									
32	2	100.0	37.0	698852	632974	0	L07	200	700
32	2	100.0	37.0	698852	632974	0	L10	400	820
J3									
33	2	90.0	70.0	697500	633000	0	L02b	1	300
33	2	90.0	70.0	697500	633000	0	L10	1	580
K1									
34	2	50.0	40.0	700032	629925	0	L07	370	750
34	2	50.0	40.0	701140	631194	0	L10	200	800
L1									
35	2	255.0	7.0	699386	632896	0	L04b	1	160
35	2	254.8	7.0	724802	624239	−3,300	L08	1	536
L1 curved									
75	2	95.4	6.7	702314	631248	0	L04b	1	29
75	2	253.6	6.1	699233	631510	0	L04b	31	76
75	2	259.2	11.9	700118	631193	0	L04b	79	159
L2									
36	2	255.0	7.0	700545	632584	0	L04b	50	160
36	2	88.2	20.4	701091	631077	0	L04b	1	43
36	2	255.0	7.0	700545	632584	0	L08	1	536
36	1	255.0	7.0	700545	632584	0	**L13**	1	240
M1									
37	2	80.0	11.0	705791	631781	0	**L04b**	50	160
37	2	80.0	11.0	705791	631781	0	L05b	1	621
37	2	80.0	11.0	705791	631781	0	L08	1	536

| Reflector (label)	Visibility	Strike	Dip	Northing (m) +6000000	Easting (m) +1000000	Depth (m)	Profile	First station	Last station
M2									
38	**2**	80.0	11.0	709729	631074	0	**L04b**	1	160
38	**2**	80.0	11.0	709729	631074	0	L05b	1	621
38	**2**	80.00	11.00	709729	631074	0	L08	1	536
A0									
41	**2**	81.7	50.4	701876	630913	0	**L04b**	1	160
41	**2**	81.7	50.0	702132	632194	0	**L05b**	1	230
41	**2**	81.1	45.0	702603	631291	400	**L06**	1	562
41	**2**	81.0	39.0	702527	630909	−2	**L07**	1	200
41	**2**	82.2	41.1	702246	630536	0	**L08**	1	536
41	**2**	81.1	45.0	701847	629246	0	**L11**	1	187
41	**1**	81.0	45.0	698702	630493	−3,300	**L12**	1	360
41	**2**	81.1	45.0	701919	629513	0	**L13**	1	240

5.1 Reflector A1
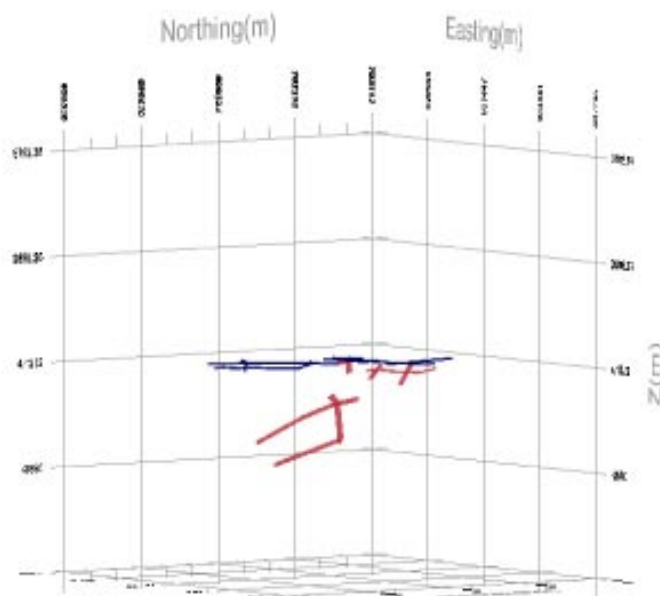
Figure 5-4. *Reflector A1, elements from profiles 2b, 4b, 5b, 6, 7, 8, 11 and 12, view from southeast.*

Element corner no	Northing (m)	Easting (m)	Elevation (m)	Label	Reflector ID	Profile
1	6698471	1629706	−2,759.05	1	A1	L02b
2	6698374	1629829	−2,884	1	A1	L02b
3	6699657	1631625	−2,109.33	1	A1	L02b
4	6699754	1631502	−1,984.38	1	A1	L02b
1	6701149	1630859	−499.23	1	A1	L04b
2	6701166	1631055	−533.39	1	A1	L04b
3	6701580	1631087	−142.15	1	A1	L04b
4	6701563	1630890	−107.99	1	A1	L04b
1	6701347	1632136	−609.92	1	A1	L05b
2	6701398	1632329	−610.11	1	A1	L05b
3	6701951	1632183	−38.61	1	A1	L05b
4	6701899	1631989	−38.43	1	A1	L05b
1	6699536	1631440	−2,179.02	1	A1	L06
2	6699593	1631631	−2,173.58	1	A1	L06
3	6699713	1631592	−2,047.15	1	A1	L06
4	6699656	1631400	−2,052.59	1	A1	L06
1	6699626	1631424	−2,087.5	1	A1	L06
2	6699746	1631563	−2,007.51	1	A1	L06
3	6700374	1630512	−1,128.84	1	A1	L06
4	6700254	1630374	−1,208.83	1	A1	L06
1	6700244	1630401	−1,225.61	1	A1	L06
2	6700387	1630477	−1,107.9	1	A1	L06
3	6700469	1630018	−909.21	1	A1	L06
4	6700327	1629942	−1,026.91	1	A1	L06
1	6700585	1631141	−1,087.99	1	A1	L07
2	6700702	1631053	−952.14	1	A1	L07
3	6700341	1630331	−1,113.86	1	A1	L07
4	6700224	1630420	−1,249.71	1	A1	L07
1	6700234	1630436	−1,244.49	1	A1	L07
2	6700326	1630308	−1,122.15	1	A1	L07
3	6699711	1629500	−1,507.13	1	A1	L07
4	6699619	1629629	−1,629.47	1	A1	L07
1	6699627	1629637	−1,624.34	1	A1	L07
2	6699699	1629485	−1,515.71	1	A1	L07
3	6698677	1628482	−2,242.74	1	A1	L07
4	6698605	1628634	−2,351.38	1	A1	L07
1	6701311	1630618	−251.11	1	A1	L08
2	6701246	1630647	−321.41	1	A1	L08
3	6701413	1631119	−282.93	1	A1	L08
4	6701478	1631090	−212.64	1	A1	L08
1	6701481	1631102	−212.61	1	A1	L08
2	6701412	1631116	−283.25	1	A1	L08
3	6701576	1631816	−305.25	1	A1	L08
4	6701646	1631802	−234.61	1	A1	L08
1	6701646	1631803	−234.74	1	A1	L08
2	6701578	1631825	−305.38	1	A1	L08
3	6701826	1632652	−279.91	1	A1	L08
4	6701894	1632629	−209.27	1	A1	L08

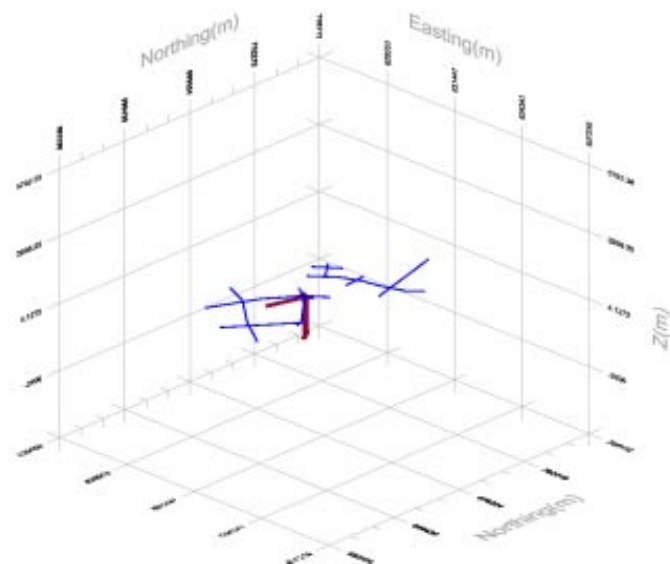| Element corner no	Northing (m)	Easting (m)	Elevation (m)	Label	Reflector ID	Profile
1	6701890	1632620	–209.98	1	A1	L08
2	6701834	1632669	–276.83	1	A1	L08
3	6702085	1633127	–153.07	1	A1	L08
4	6702141	1633079	–86.22	1	A1	L08
1	6701131	1629306	–85.74	1	A1	L11
2	6701014	1629395	–221.53	1	A1	L11
3	6701223	1629812	–127.57	1	A1	L11
4	6701340	1629723	8.21	1	A1	L11
1	6700985	1630013	–410.02	1	A1	L12
2	6701101	1630157	–335.03	1	A1	L12
3	6701353	1629776	7.25	1	A1	L12
4	6701237	1629632	–67.74	1	A1	L12

5.2   Reflector A2
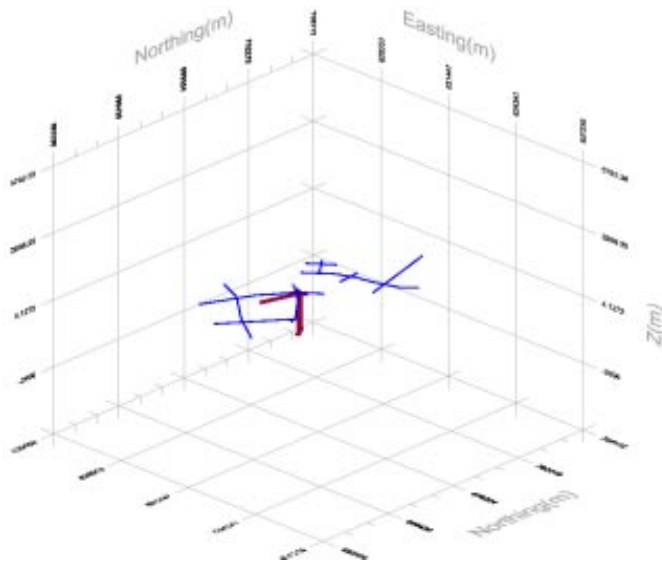
Figure 5-5. *Reflector A2, elements from profiles 6 and 7, view from southeast.*

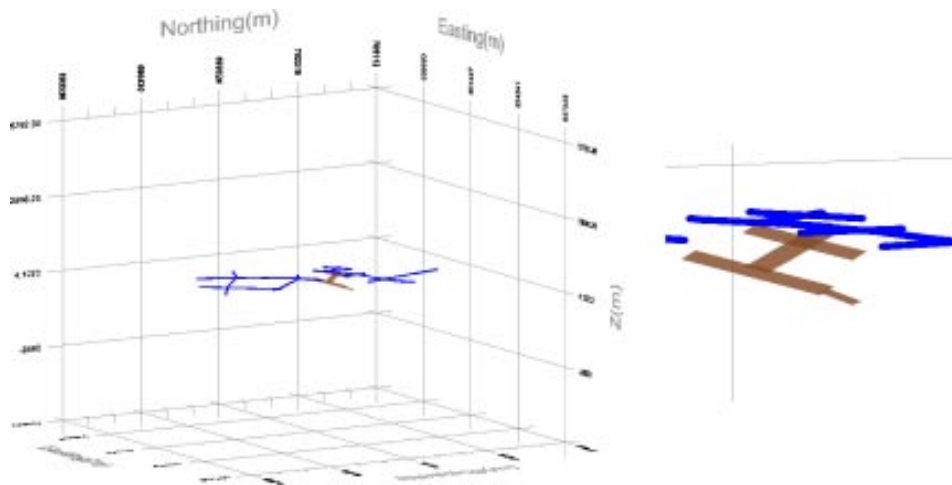| Element corner no	Northing (m)	Easting (m)	Elevation (m)	Label	Reflector ID	Profile
1	6697728	1631951	–751.76	2	A2	L06
2	6697785	1632143	–742.53	2	A2	L06
3	6697993	1632077	–655.12	2	A2	L06
4	6697936	1631885	–664.35	2	A2	L06
1	6697904	1631904	–678.48	2	A2	L06
2	6698032	1632052	–637.87	2	A2	L06
3	6699277	1630815	–55.65	2	A2	L06
4	6699149	1630667	–96.26	2	A2	L06
1	6699132	1630691	–104.81	2	A2	L06
2	6699299	1630782	–44.48	2	A2	L06
3	6699405	1630548	14.01	2	A2	L06
4	6699238	1630457	–46.32	2	A2	L06
1	6699297	1631027	–62.5	2	A2	L07
2	6699447	1630912	5.03	2	A2	L07
3	6699249	1630619	–53.27	2	A2	L07
4	6699099	1630733	–120.8	2	A2	L07
1	6699115	1630751	–115.89	2	A2	L07
2	6699226	1630594	–60.55	2	A2	L07
3	6698352	1629868	–357.18	2	A2	L07
4	6698241	1630024	–412.52	2	A2	L07
1	6698236	1630020	–414.25	2	A2	L07
2	6698350	1629865	–358.13	2	A2	L07
3	6698332	1629850	–364.01	2	A2	L07
4	6698219	1630005	–420.13	2	A2	L07

5.3   Reflector B8

Figure 5-6. *Reflector B8, elements from profiles 8, 11, 12 and 13, view from southeast (left) and detailed view (right).*

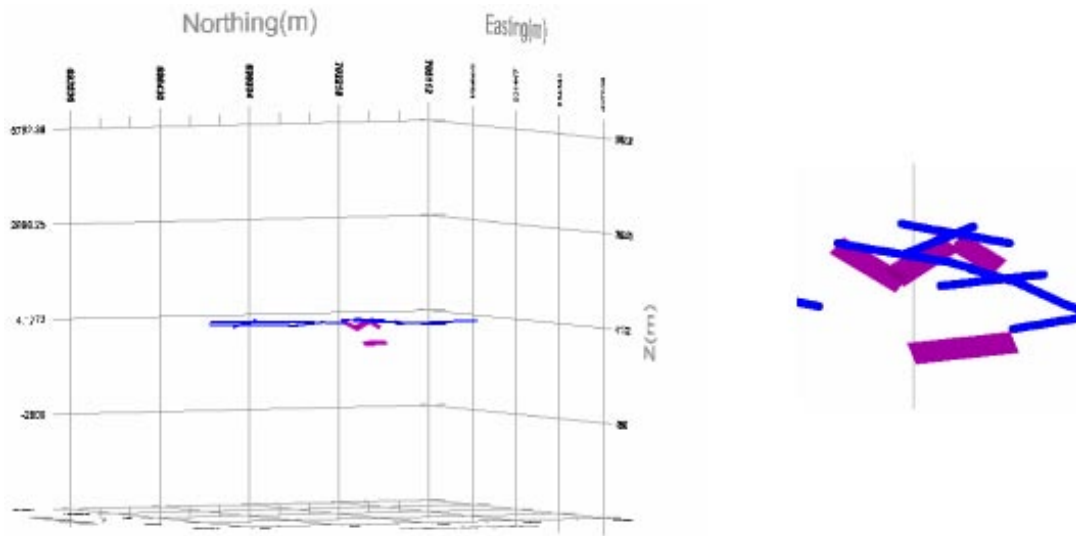| Element corner no	Northing (m)	Easting (m)	Elevation (m)	Label	Reflector ID	Profile
1	6701107	1630461	−566.4	15	B8	L08
2	6701018	1630500	−590.93	15	B8	L08
3	6701165	1630775	−682.99	15	B8	L08
4	6701254	1630736	−658.47	15	B8	L08
1	6701008	1629275	−113.92	15	B8	L11
2	6700858	1629391	−175.1	15	B8	L11
3	6701448	1630052	−371.24	15	B8	L11
4	6701598	1629936	−310.06	15	B8	L11
1	6700665	1629937	−408.23	15	B8	L12
2	6700787	1630089	−454.53	15	B8	L12
3	6701459	1629623	−202.45	15	B8	L12
4	6701337	1629471	−156.15	15	B8	L12
1	6700431	1629579	−292.93	15	B8	L13
2	6700277	1629691	−352.92	15	B8	L13
3	6701004	1630551	−612.16	15	B8	L13
4	6701158	1630438	−552.17	15	B8	L13

5.4   Curved reflector group B8

Figure 5-7. *Curved reflector group B8 as an alternative interpretation for B8, 3D elements from profiles 11, 12 and 13, view from southeast (left), detailed view (right).*

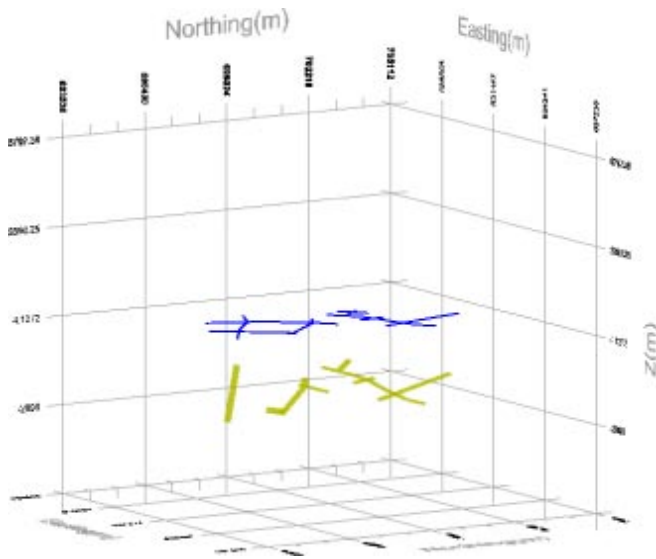| Element corner no	Northing (m)	Easting (m)	Elevation (m)	Label	Reflector ID	Profile
1	6701289	1629669	–217.69	55	B8 curved	L11
2	6701213	1629727	–248.33	55	B8 curved	L11
3	6701464	1629994	–358.61	55	B8 curved	L11
4	6701539	1629936	–327.96	55	B8 curved	L11
1	6701152	1629499	–210.52	55	B8 curved	L11
2	6701077	1629557	–241.1	55	B8 curved	L11
3	6701243	1629763	–253.63	55	B8 curved	L11
4	6701318	1629705	–223.06	55	B8 curved	L11
1	6700984	1629314	–143.63	55	B8 curved	L11
2	6700909	1629372	–174.11	55	B8 curved	L11
3	6701038	1629515	–222.94	55	B8 curved	L11
4	6701114	1629458	–192.45	55	B8 curved	L11
1	6701302	1629585	–230.22	55	B8 curved	L12
2	6701326	1629615	–239.28	55	B8 curved	L12
3	6701421	1629551	–194.53	55	B8 curved	L12
4	6701397	1629521	–185.47	55	B8 curved	L12
1	6700641	1629954	–424.69	55	B8 curved	L12
2	6700763	1630106	–470.11	55	B8 curved	L12
3	6700968	1629955	–423.55	55	B8 curved	L12
4	6700845	1629803	–378.14	55	B8 curved	L12
1	6701135	1629611	–241.94	55	B8 curved	L12
2	6701257	1629762	–287.38	55	B8 curved	L12
3	6701296	1629733	–280.52	55	B8 curved	L12
4	6701174	1629581	–235.08	55	B8 curved	L12
1	6701044	1629680	–255.42	55	B8 curved	L12
2	6701167	1629831	–300.79	55	B8 curved	L12
3	6701225	1629788	–288.31	55	B8 curved	L12
4	6701102	1629636	–242.95	55	B8 curved	L12
1	6700940	1629740	–334.99	55	B8 curved	L12
2	6701062	1629892	–380.36	55	B8 curved	L12
3	6701230	1629785	–283.42	55	B8 curved	L12
4	6701108	1629634	–238.05	55	B8 curved	L12
1	6700689	1629938	–378.18	55	B8 curved	L13
2	6700615	1629998	–409.14	55	B8 curved	L13
3	6700811	1630213	–459.82	55	B8 curved	L13
4	6700885	1630153	–428.86	55	B8 curved	L13
1	6700876	1630137	–431.47	55	B8 curved	L13
2	6700793	1630186	–458.8	55	B8 curved	L13
3	6701019	1630499	–579.34	55	B8 curved	L13
4	6701102	1630450	–552.01	55	B8 curved	L13
1	6700421	1629645	–310.73	55	B8 curved	L13
2	6700347	1629705	–341.11	55	B8 curved	L13
3	6700514	1629902	–361.7	55	B8 curved	L13
4	6700588	1629842	–331.32	55	B8 curved	L13
1	6700547	1629794	–313.34	55	B8 curved	L13
2	6700474	1629854	–345.09	55	B8 curved	L13
3	6700568	1629946	–386.65	55	B8 curved	L13
4	6700641	1629886	–354.9	55	B8 curved	L13

5.5 Reflector B9

Figure 5-8. *Reflector B9, elements from profiles 4b, 11, 12 and 13, view from southeast (left) and detailed view (right).*

Element corner no	Northing (m)	Easting (m)	Elevation (m)	Label	Reflector ID	Profile
1	6700605	1630486	−613.36	16	B9	L04b
2	6700619	1630643	−736.49	16	B9	L04b
3	6701411	1630574	−736.54	16	B9	L04b
4	6701397	1630417	−613.41	16	B9	L04b
1	6701289	1629673	−27.43	16	B9	L11
2	6701143	1629786	−105.18	16	B9	L11
3	6701398	1629992	−283.23	16	B9	L11
4	6701543	1629880	−205.47	16	B9	L11
1	6700612	1629931	−181.98	16	B9	L12
2	6700717	1630062	−290.78	16	B9	L12
3	6701213	1629802	−122.18	16	B9	L12
4	6701108	1629671	−13.39	16	B9	L12
1	6700389	1629687	22.96	16	B9	L13
2	6700246	1629803	−57.12	16	B9	L13
3	6700637	1630104	−318.1	16	B9	L13
4	6700779	1629988	−238.03	16	B9	L13

5.6 Reflector C1

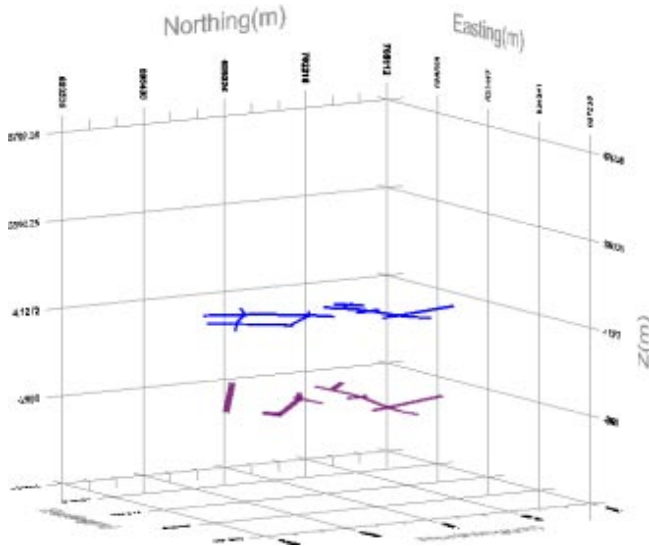

Figure 5-9. *Reflector C1, 3D elements from profiles 2b, 4b, 5b, 6, 7, 8, 10, 12, 13, view from south-east.*

Element corner no	Northing (m)	Easting (m)	Elevation (m)	Label	Reflector ID	Profile
1	6697630	1630642	–2,600.06	17	C1	L02b
2	6697395	1630940	–2,726.95	17	C1	L02b
3	6697866	1631279	–2,801.82	17	C1	L02b
4	6698101	1630981	–2,674.93	17	C1	L02b
1	6700855	1630228	–2,150.79	17	C1	L04b
2	6700872	1630417	–2,215.51	17	C1	L04b
3	6701655	1630378	–2,128.08	17	C1	L04b
4	6701639	1630190	–2,063.36	17	C1	L04b
1	6695899	1630982	–2,882.44	17	C1	L10
2	6696063	1631093	–2,906.21	17	C1	L10
3	6698235	1628160	–1,670.54	17	C1	L10
4	6698071	1628049	–1,646.78	17	C1	L10
1	6700998	1631392	–2,546.53	17	C1	L05b
2	6701047	1631577	–2,606.68	17	C1	L05b
3	6703995	1630952	–2,109.51	17	C1	L05b
4	6703946	1630768	–2,049.36	17	C1	L05b
1	6697691	1631036	–2,732.67	17	C1	L06
2	6697745	1631219	–2,791.94	17	C1	L06
3	6697984	1631162	–2,749.36	17	C1	L06
4	6697930	1630979	–2,690.09	17	C1	L06
1	6697897	1630993	–2,698.38	17	C1	L06
2	6698025	1631142	–2,738.38	17	C1	L06
3	6699453	1630046	–2,218.78	17	C1	L06
4	6699325	1629898	–2,178.78	17	C1	L06
1	6699304	1629921	–2,188.77	17	C1	L06
2	6699479	1630015	–2,205.48	17	C1	L06

Element corner no	Northing (m)	Easting (m)	Elevation (m)	Label	Reflector ID	Profile
3	6699737	1629569	−2,024.17	17	C1	L06
4	6699562	1629474	−2,007.46	17	C1	L06
1	6699802	1630593	−2,378.14	17	C1	L07
2	6699955	1630476	−2,322.76	17	C1	L07
3	6699420	1629855	−2,154.83	17	C1	L07
4	6699267	1629972	−2,210.2	17	C1	L07
1	6699285	1629988	−2,214.18	17	C1	L07
2	6699394	1629834	−2,149.57	17	C1	L07
3	6699287	1629764	−2,135.08	17	C1	L07
4	6699177	1629918	−2,199.69	17	C1	L07
1	6701283	1629952	−2,013.12	17	C1	L08
2	6701105	1630030	−2,057.56	17	C1	L08
3	6701320	1630448	−2,184.09	17	C1	L08
4	6701499	1630369	−2,139.65	17	C1	L08
1	6701507	1630393	−2,147.27	17	C1	L08
2	6701314	1630432	−2,179.33	17	C1	L08
3	6701477	1631065	−2,386.41	17	C1	L08
4	6701670	1631026	−2,354.35	17	C1	L08
1	6701668	1631019	−2,352.14	17	C1	L08
2	6701482	1631081	−2,391.41	17	C1	L08
3	6701776	1631819	−2,623.34	17	C1	L08
4	6701962	1631757	−2,584.07	17	C1	L08
1	6701945	1631729	−2,575.73	17	C1	L08
2	6701800	1631855	−2,633.5	17	C1	L08
3	6702180	1632245	−2,735.04	17	C1	L08
4	6702325	1632120	−2,677.27	17	C1	L08
1	6700798	1629438	−1,878.09	17	C1	L12
2	6700921	1629590	−1,920	17	C1	L12
3	6701598	1629108	−1,686.77	17	C1	L12
4	6701475	1628955	−1,644.85	17	C1	L12
1	6700567	1629072	−1,771.5	17	C1	L13
2	6700412	1629186	−1,826.01	17	C1	L13
3	6701135	1630062	−2,065.86	17	C1	L13
4	6701290	1629948	−2,011.35	17	C1	L13

5.7 Reflector C2

Figure 5-10. *Reflector C2, 3D elements from profiles 2b, 4b, 5b, 6, 7, 8, 10, 12, 13, view from south-east.*

Element corner no	Northing (m)	Easting (m)	Elevation (m)	Label	Reflector ID	Profile
1	6697338	1631053	–2,932.46	18	C2	L02b
2	6697093	1631365	–2,983.5	18	C2	L02b
3	6697556	1631718	–3,052.56	18	C2	L02b
4	6697801	1631406	–3,001.52	18	C2	L02b
1	6700605	1630483	–2,882.49	18	C2	L04b
2	6700622	1630679	–2,917.22	18	C2	L04b
3	6701414	1630610	–2,917.18	18	C2	L04b
4	6701397	1630413	–2,882.45	18	C2	L04b
1	6695997	1630873	–2,880.14	18	C2	L10
2	6696160	1630986	–2,902.48	18	C2	L10
3	6697998	1628405	–2,477.49	18	C2	L10
4	6697835	1628293	–2,455.15	18	C2	L10
1	6700706	1631747	–3,106.11	18	C2	L05b
2	6700757	1631938	–3,140.33	18	C2	L05b
3	6703753	1631154	–3,048.79	18	C2	L05b
4	6703702	1630964	–3,014.56	18	C2	L05b
1	6697383	1631474	–3,006.98	18	C2	L06
2	6697439	1631662	–3,041.03	18	C2	L06
3	6697682	1631592	–3,032.36	18	C2	L06
4	6697626	1631403	–2,998.31	18	C2	L06
1	6697594	1631419	–3,000.7	18	C2	L06
2	6697723	1631569	–3,028.98	18	C2	L06
3	6699203	1630325	–2,833.26	18	C2	L06
4	6699073	1630176	–2,804.97	18	C2	L06
1	6699053	1630199	–2,808.75	18	C2	L06

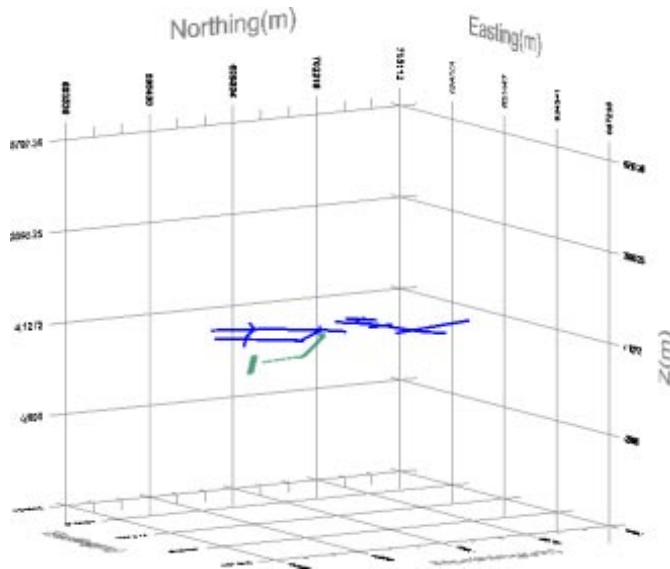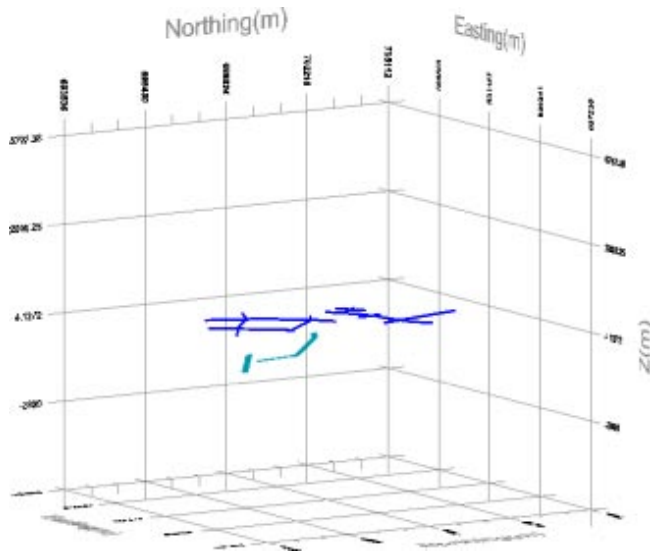| Element corner no	Northing (m)	Easting (m)	Elevation (m)	Label	Reflector ID	Profile
2	6699228	1630293	–2,828.03	18	C2	L06
3	6699505	1629797	–2,745.17	18	C2	L06
4	6699329	1629703	–2,725.89	18	C2	L06
1	6699533	1630907	–2,940.45	18	C2	L07
2	6699691	1630786	–2,921.65	18	C2	L07
3	6699174	1630128	–2,798.14	18	C2	L07
4	6699015	1630249	–2,816.93	18	C2	L07
1	6699033	1630266	–2,820.27	18	C2	L07
2	6699148	1630105	–2,793.63	18	C2	L07
3	6699042	1630032	–2,779.24	18	C2	L07
4	6698927	1630194	–2,805.88	18	C2	L07
1	6701050	1630167	–2,833.89	18	C2	L08
2	6700867	1630248	–2,845.21	18	C2	L08
3	6701069	1630696	–2,926.97	18	C2	L08
4	6701252	1630615	–2,915.65	18	C2	L08
1	6701260	1630640	–2,920.16	18	C2	L08
2	6701064	1630680	–2,924.15	18	C2	L08
3	6701205	1631364	–3,046.48	18	C2	L08
4	6701401	1631324	–3,042.49	18	C2	L08
1	6701399	1631317	–3,041.23	18	C2	L08
2	6701210	1631380	–3,049.38	18	C2	L08
3	6701480	1632175	–3,193.16	18	C2	L08
4	6701670	1632112	–3,185.01	18	C2	L08
1	6701653	1632082	–3,179.49	18	C2	L08
2	6701503	1632213	–3,200.1	18	C2	L08
3	6701872	1632625	–3,278.26	18	C2	L08
4	6702023	1632495	–3,257.65	18	C2	L08
1	6700576	1629622	–2,730.9	18	C2	L12
2	6700701	1629776	–2,759.85	18	C2	L12
3	6701400	1629228	–2,674.2	18	C2	L12
4	6701276	1629074	–2,645.25	18	C2	L12
1	6700359	1629235	–2,659.56	18	C2	L13
2	6700198	1629353	–2,677.71	18	C2	L13
3	6700896	1630282	–2,851.68	18	C2	L13
4	6701056	1630165	–2,833.53	18	C2	L13

5.8   Reflector G5

Figure 5-11. *Reflector G5, 3D elements from profiles 2b, 10, 6, view from southeast.*

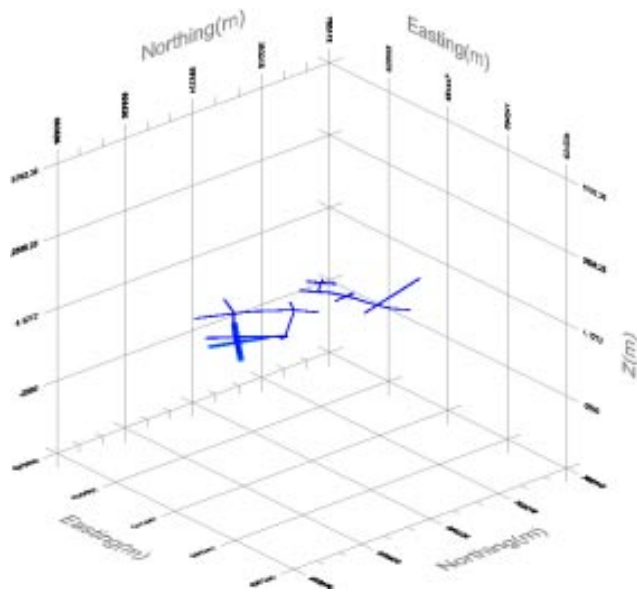| Element corner no	Northing (m)	Easting (m)	Elevation (m)	Label	Reflector ID	Profile
1	6696885	1631216	–708.57	25	G5	L02b
2	6696762	1631373	–728.51	25	G5	L02b
3	6697765	1632190	–488.53	25	G5	L02b
4	6697888	1632034	–468.59	25	G5	L02b
1	6695815	1632032	–902.51	25	G5	L10
2	6695973	1632148	–865.06	25	G5	L10
3	6697258	1630333	–663.13	25	G5	L10
4	6697100	1630217	–700.57	25	G5	L10
1	6697542	1632024	–541.4	25	G5	L06
2	6697598	1632215	–522.47	25	G5	L06
3	6697832	1632141	–476.37	25	G5	L06
4	6697775	1631950	–495.3	25	G5	L06
1	6697743	1631968	–501.42	25	G5	L06
2	6697872	1632117	–468.87	25	G5	L06
3	6699296	1630830	–218.23	25	G5	L06
4	6699167	1630681	–250.77	25	G5	L06
1	6699148	1630704	–253.84	25	G5	L06
2	6699320	1630797	–214.27	25	G5	L06
3	6699588	1630285	–177.23	25	G5	L06
4	6699415	1630192	–216.8	25	G5	L06

5.9 Reflector G6

Figure 5-12. *Reflector G6, 3D elements from profiles 2b, 10, and 06, view from southeast.*

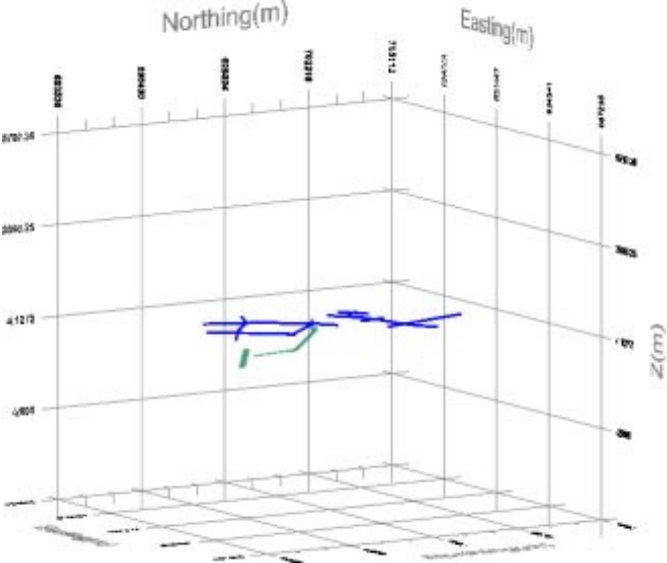| Element corner no	Northing (m)	Easting (m)	Elevation (m)	Label	Reflector ID	Profile
1	6696955	1631229	−1,043.44	26	G6	L02b
2	6696832	1631385	−1,063.38	26	G6	L02b
3	6697835	1632203	−823.4	26	G6	L02b
4	6697958	1632046	−803.46	26	G6	L02b
1	6695885	1632044	−1,237.38	26	G6	L10
2	6696043	1632161	−1,199.94	26	G6	L10
3	6697328	1630346	−998	26	G6	L10
4	6697170	1630230	−1,035.44	26	G6	L10
1	6697612	1632037	−876.18	26	G6	L06
2	6697668	1632228	−857.24	26	G6	L06
3	6697902	1632154	−811.17	26	G6	L06
4	6697845	1631963	−830.1	26	G6	L06
1	6697813	1631980	−836.21	26	G6	L06
2	6697942	1632130	−803.68	26	G6	L06
3	6699366	1630842	−553.18	26	G6	L06
4	6699237	1630693	−585.72	26	G6	L06
1	6699218	1630717	−588.79	26	G6	L06
2	6699390	1630810	−549.23	26	G6	L06
3	6699658	1630298	−512.22	26	G6	L06
4	6699485	1630205	−551.78	26	G6	L06

5.10   Reflector G7

Figure 5-13. *Reflector G6, 3D elements from profiles 2b and 10, view from southeast.*

Element corner no	Northing (m)	Easting (m)	Elevation (m)	Label	Reflector ID	Profile
1	6695708	1630592	–378.1	27	G7	L02b
2	6695831	1630435	–358.18	27	G7	L02b
3	6697326	1631653	–0.23	27	G7	L02b
4	6697203	1631809	–20.15	27	G7	L02b
1	6695853	1632128	–291.08	27	G7	L10
2	6695695	1632010	–328.37	27	G7	L10
3	6697139	1630006	–100.15	27	G7	L10
4	6697296	1630123	–62.86	27	G7	L10

5.11 Reflector J1

Figure 5-14. *Reflector J1, 3D elements from profiles 2b and 10, view from southeast.*

Element corner no	Northing (m)	Easting (m)	Elevation (m)	Label	Reflector ID	Profile
1	6697138	1631279	−1,515.66	31	J1	L02b
2	6697258	1631126	−1,466.9	31	J1	L02b
3	6697856	1631904	−500.06	31	J1	L02b
4	6697737	1632056	−548.82	31	J1	L02b
1	6697051	1632431	−1,063.5	31	J1	L10
2	6696941	1632351	−1,210.85	31	J1	L10
3	6697803	1630860	−1,043.06	31	J1	L10
4	6697913	1630939	−895.7	31	J1	L10

5.12   Reflector J2
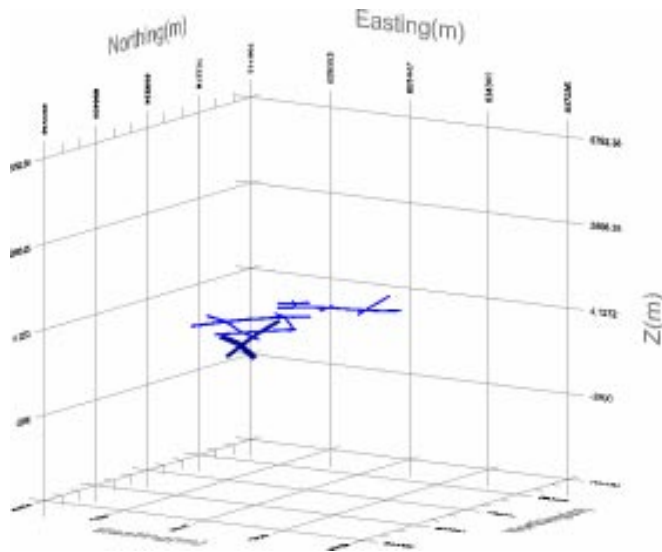
Figure 5-15. *Reflector J2, 3D elements from profiles 7 and 10.*

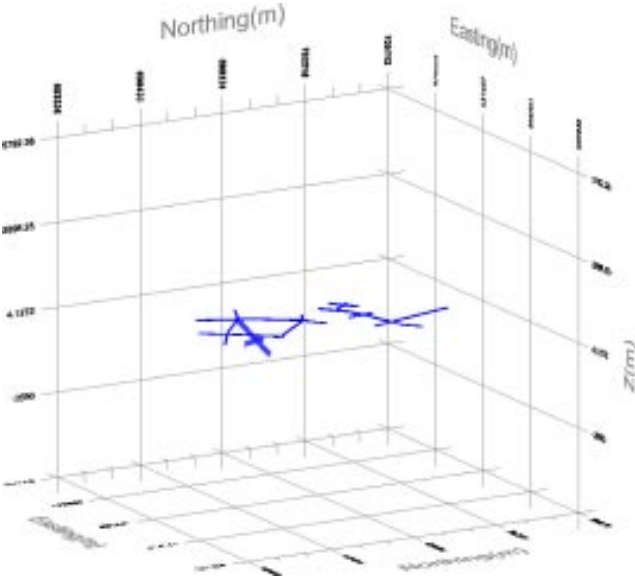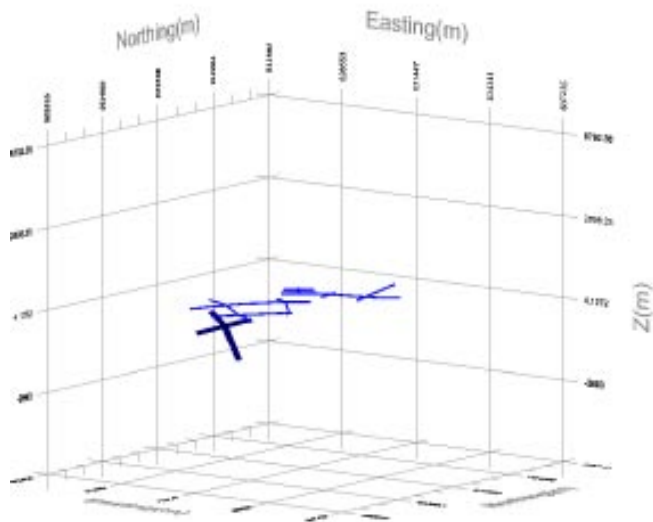| Element corner no	Northing (m)	Easting (m)	Elevation (m)	Label	Reflector ID	Profile
1	6697790	1630649	−1,092.86	32	J2	L10
2	6697663	1630539	−1,201.48	32	J2	L10
3	6698195	1629648	−923.1	32	J2	L10
4	6698322	1629758	−814.48	32	J2	L10
1	6698334	1629731	−809.21	32	J2	L10
2	6698186	1629666	−927.29	32	J2	L10
3	6698494	1628768	−816.22	32	J2	L10
4	6698642	1628833	−698.14	32	J2	L10
1	6699170	1630542	−82.96	32	J2	L07
2	6699059	1630697	−144.62	32	J2	L07
3	6698526	1630129	−614.72	32	J2	L07
4	6698636	1629974	−553.06	32	J2	L07
1	6698620	1629961	−566.56	32	J2	L07
2	6698536	1630138	−605.9	32	J2	L07
3	6697751	1629619	−1,256.59	32	J2	L07
4	6697835	1629442	−1,217.25	32	J2	L07

5.13 Reflector J3

Figure 5-16. *Reflector J3, 3D elements from profiles 2b and 10, view from southeast.*

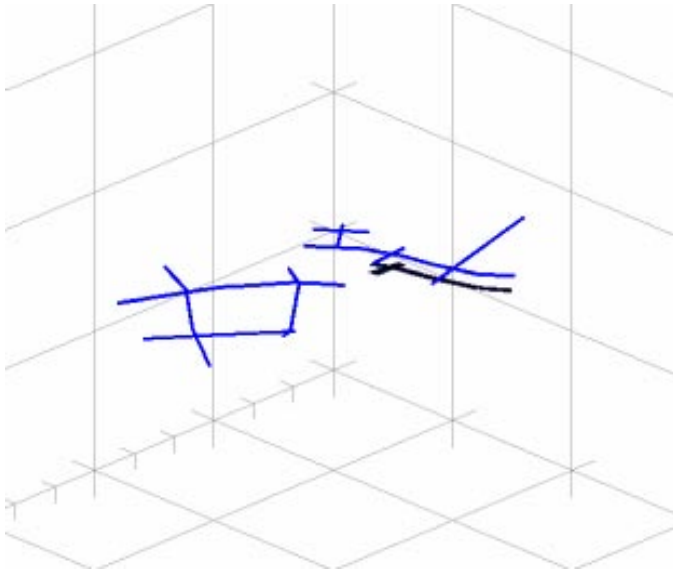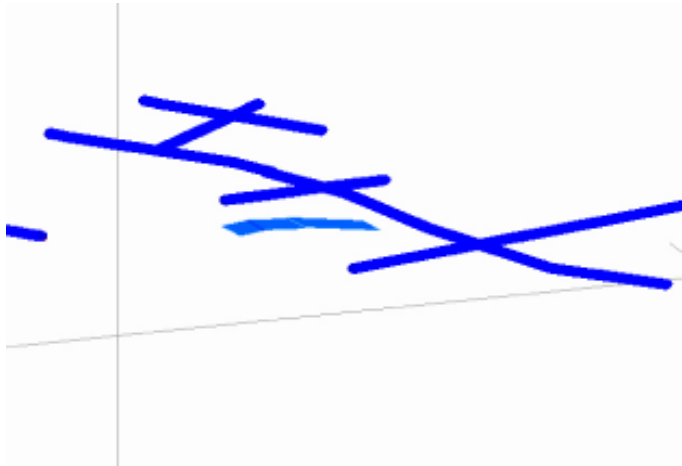| Element corner no	Northing (m)	Easting (m)	Elevation (m)	Label	Reflector ID	Profile
1	6697259	1630540	−661.82	33	J3	L02b
2	6697322	1630459	−489.83	33	J3	L02b
3	6697461	1631381	−108.12	33	J3	L02b
4	6697398	1631462	−280.11	33	J3	L02b
1	6697326	1632083	−479.36	33	J3	L10
2	6697260	1632032	−661.04	33	J3	L10
3	6697467	1629737	−90.54	33	J3	L10
4	6697533	1629788	91.15	33	J3	L10

5.14 Reflector K1

Figure 5-17. *Reflector K1, 3D elements from profiles 10 and 7, view from southeast.*

Element corner no	Northing (m)	Easting (m)	Elevation (m)	Label	Reflector ID	Profile
1	6697378	1630170	−1,865.9	34	K1	L10
2	6697531	1630295	−1,834.91	34	K1	L10
3	6698216	1629201	−804.25	34	K1	L10
4	6698063	1629076	−835.23	34	K1	L10
1	6698054	1629097	−852.31	34	K1	L10
2	6698226	1629173	−782.79	34	K1	L10
3	6698330	1628584	−398.37	34	K1	L10
4	6698158	1628508	−467.89	34	K1	L10
1	6698741	1629795	−759.46	34	K1	L07
2	6698833	1629670	−633.15	34	K1	L07
3	6698658	1629514	−661.35	34	K1	L07
4	6698567	1629639	−787.67	34	K1	L07
1	6698574	1629645	−785.82	34	K1	L07
2	6698642	1629501	−664.58	34	K1	L07
3	6697364	1628610	−1,005.58	34	K1	L07
4	6697296	1628754	−1,126.82	34	K1	L07

5.15 Reflector L1

Figure 5-18. *Reflector L1, 3D elements from profiles 4b and 8, view from southeast.*

Element corner no	Northing (m)	Easting (m)	Elevation (m)	Label	Reflector ID	Profile
1	6700642	1631197	–202.91	35	L1	L04b
2	6700624	1630998	–207.16	35	L1	L04b
3	6701405	1630931	–301.89	35	L1	L04b
4	6701423	1631130	–297.63	35	L1	L04b
1	6700881	1630755	–246.84	35	L1	L08
2	6701062	1630675	–271.02	35	L1	L08
3	6701265	1631137	–280.14	35	L1	L08
4	6701083	1631217	–255.97	35	L1	L08
1	6701078	1631202	–255.82	35	L1	L08
2	6701272	1631162	–280.21	35	L1	L08
3	6701416	1631868	–274.57	35	L1	L08
4	6701222	1631907	–250.17	35	L1	L08
1	6701226	1631923	–250.13	35	L1	L08
2	6701414	1631861	–274.54	35	L1	L08
3	6701686	1632681	–280.35	35	L1	L08
4	6701498	1632744	–255.94	35	L1	L08
1	6701520	1632781	–257.41	35	L1	L08
2	6701670	1632651	–279.46	35	L1	L08
3	6702037	1633078	–309.26	35	L1	L08
4	6701887	1633209	–287.22	35	L1	L08

5.16   Curved reflector group L1

Figure 5-19. *Curved reflector group L1 as an alternative interpretation to reflector L, 3D elements from profile 4b, detailed view from southeast.*
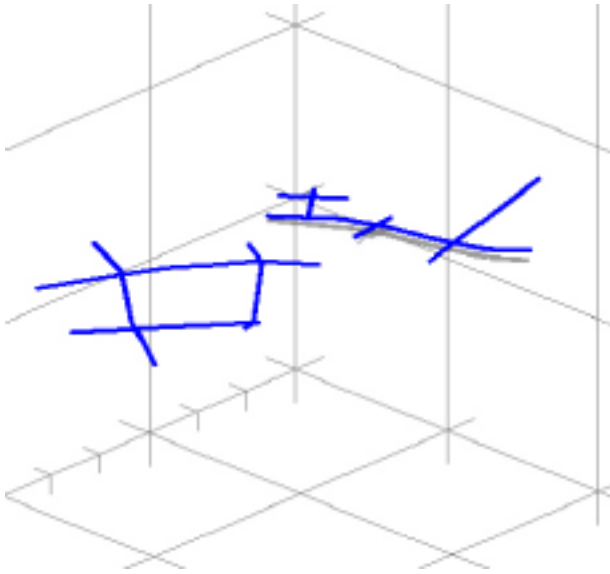
Element corner no	Northing (m)	Easting (m)	Elevation (m)	Label	Reflector ID	Profile
1	6700672	1630993	−194.46	75	L1 curved	L04b
2	6700689	1631192	−190.21	75	L1 curved	L04b
3	6700827	1631180	−174.29	75	L1 curved	L04b
4	6700809	1630981	−178.54	75	L1 curved	L04b
1	6700798	1631183	−171.66	75	L1 curved	L04b
2	6700780	1630983	−175.92	75	L1 curved	L04b
3	6701002	1630964	−199.38	75	L1 curved	L04b
4	6701019	1631164	−195.12	75	L1 curved	L04b
1	6701015	1631164	−187.81	75	L1 curved	L04b
2	6700997	1630965	−192.06	75	L1 curved	L04b
3	6701379	1630933	−272.83	75	L1 curved	L04b
4	6701397	1631132	−268.58	75	L1 curved	L04b

5.17 Reflector L2

Figure 5-20. *Reflector L2, 3D elements from profiles 4b and 8, detailed view from southeast.*

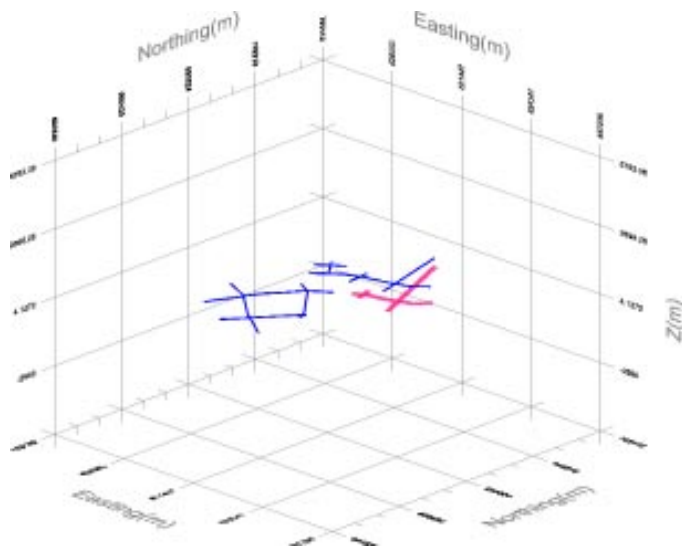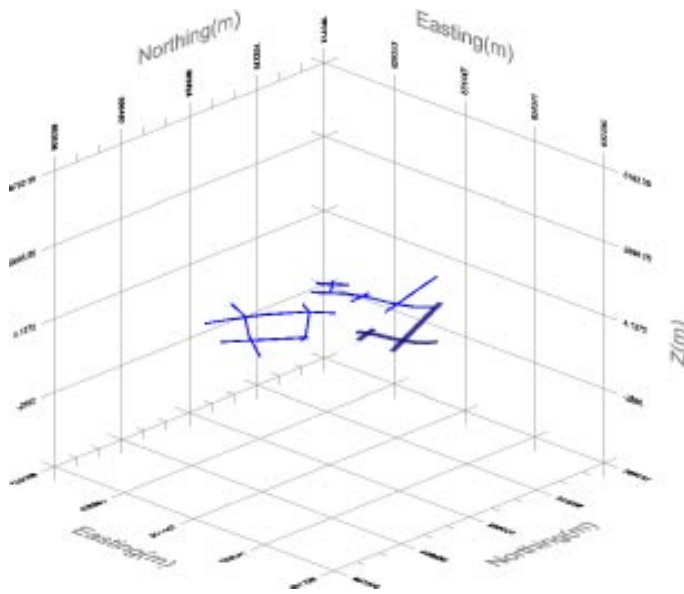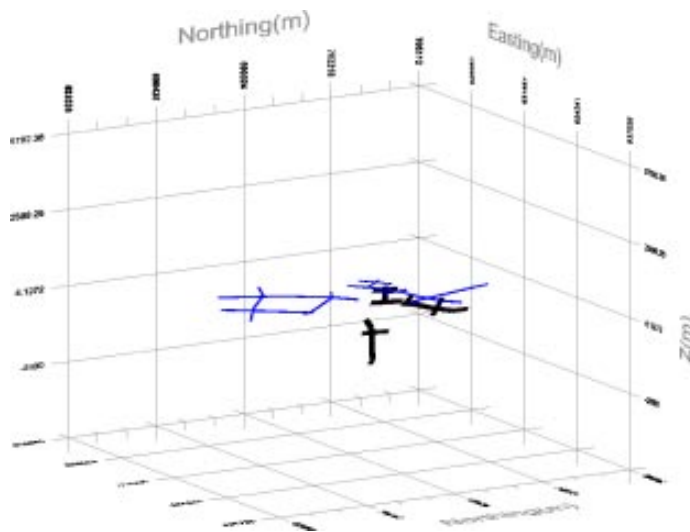| Element corner no	Northing (m)	Easting (m)	Elevation (m)	Label	Reflector ID	Profile
1	6700900	1631172	−86.95	36	L2	L04b
2	6700882	1630972	−91.21	36	L2	L04b
3	6701423	1630926	−156.74	36	L2	L04b
4	6701440	1631126	−152.48	36	L2	L04b
1	6700709	1631069	−142.07	36	L2	L04b
2	6700713	1631109	−141.22	36	L2	L04b
3	6700896	1631091	−72.71	36	L2	L04b
4	6700893	1631052	−73.55	36	L2	L04b
1	6700898	1630750	−99.7	36	L2	L08
2	6701080	1630670	−123.77	36	L2	L08
3	6701282	1631132	−133.12	36	L2	L08
4	6701101	1631212	−109.05	36	L2	L08
1	6701095	1631197	−108.9	36	L2	L08
2	6701290	1631157	−133.21	36	L2	L08
3	6701434	1631863	−127.97	36	L2	L08
4	6701239	1631902	−103.66	36	L2	L08
1	6701243	1631919	−103.63	36	L2	L08
2	6701432	1631856	−127.93	36	L2	L08
3	6701703	1632676	−134.18	36	L2	L08
4	6701515	1632739	−109.87	36	L2	L08
1	6701538	1632777	−111.36	36	L2	L08
2	6701688	1632646	−133.27	36	L2	L08
3	6702055	1633074	−163.24	36	L2	L08
4	6701905	1633204	−141.32	36	L2	L08
1	6700231	1629825	−50.39	36	L2	L13
2	6700391	1629708	−73.14	36	L2	L13
3	6701086	1630669	−124.98	36	L2	L13
4	6700925	1630786	−102.23	36	L2	L13

5.18   Reflector M1

Figure 5-21. *Reflector M1, 3D elements from profiles 4b, 5b and 8, view from southeast.*

Element corner no	Northing (m)	Easting (m)	Elevation (m)	Label	Reflector ID	Profile
1	6701061	1630940	–877.14	37	M1	L04b
2	6701079	1631139	–880.51	37	M1	L04b
3	6701607	1631094	–777.84	37	M1	L04b
4	6701590	1630895	–774.47	37	M1	L04b
1	6700935	1632263	–945.97	37	M1	L05b
2	6700987	1632456	–942.62	37	M1	L05b
3	6703870	1631676	–364.23	37	M1	L05b
4	6703819	1631483	–367.59	37	M1	L05b
1	6701255	1630638	–829.97	37	M1	L08
2	6701075	1630717	–867.07	37	M1	L08
3	6701274	1631180	–844.57	37	M1	L08
4	6701454	1631101	–807.47	37	M1	L08
1	6701461	1631126	–806.92	37	M1	L08
2	6701269	1631165	–845.07	37	M1	L08
3	6701411	1631871	–841.55	37	M1	L08
4	6701604	1631832	–803.4	37	M1	L08
1	6701602	1631825	–803.56	37	M1	L08
2	6701415	1631887	–841.33	37	M1	L08
3	6701683	1632708	–817.74	37	M1	L08
4	6701870	1632646	–779.98	37	M1	L08
1	6701854	1632616	–781.9	37	M1	L08
2	6701706	1632745	–814.78	37	M1	L08
3	6702066	1633174	–760.31	37	M1	L08
4	6702215	1633044	–727.44	37	M1	L08

5.19 Reflector M2

Figure 5-22. *Reflector M2, 3D elements from profiles 4b, 5b and 8, view from southeast.*

Element corner no	Northing (m)	Easting (m)	Elevation (m)	Label	Reflector ID	Profile
1	6700970	1630935	−1,672.02	38	M2	L04b
2	6700987	1631134	−1,675.39	38	M2	L04b
3	6701751	1631069	−1,527.05	38	M2	L04b
4	6701733	1630870	−1,523.68	38	M2	L04b
1	6701078	1632238	−1,695.18	38	M2	L05b
2	6701130	1632431	−1,691.83	38	M2	L05b
3	6704014	1631651	−1,113.44	38	M2	L05b
4	6703962	1631458	−1,116.8	38	M2	L05b
1	6701398	1630613	−1,579.13	38	M2	L08
2	6701218	1630692	−1,616.23	38	M2	L08
3	6701417	1631155	−1,593.73	38	M2	L08
4	6701597	1631076	−1,556.63	38	M2	L08
1	6701604	1631101	−1,556.08	38	M2	L08
2	6701412	1631140	−1,594.23	38	M2	L08
3	6701555	1631845	−1,590.72	38	M2	L08
4	6701747	1631806	−1,552.57	38	M2	L08
1	6701745	1631800	−1,552.73	38	M2	L08
2	6701559	1631861	−1,590.5	38	M2	L08
3	6701827	1632682	−1,566.92	38	M2	L08
4	6702013	1632620	−1,529.15	38	M2	L08
1	6701998	1632591	−1,531.07	38	M2	L08
2	6701849	1632720	−1,563.95	38	M2	L08
3	6702209	1633148	−1,509.48	38	M2	L08
4	6702358	1633019	−1,476.61	38	M2	L08

5.20   Reflector A0

Figure 5-23. *Reflector A0 as an alternative interpretation to A, 3D elements from profiles 4b, 5b, 6, 7, 8, 11, 12 and 13, view from southeast.*

Element corner no	Northing (m)	Easting (m)	Elevation (m)	Label	Reflector ID	Profile
1	6701373	1630886	−596.74	41	A0	L04b
2	6701391	1631084	−610.56	41	A0	L04b
3	6701716	1631083	−221.11	41	A0	L04b
4	6701698	1630884	−207.29	41	A0	L04b
1	6701550	1632180	−684.66	41	A0	L05b
2	6701601	1632371	−657.36	41	A0	L05b
3	6702046	1632172	−98.46	41	A0	L05b
4	6701995	1631981	−125.76	41	A0	L05b
1	6699807	1631631	−2,415.57	41	A0	L06
2	6699864	1631821	−2,389.2	41	A0	L06
3	6699982	1631768	−2,263.85	41	A0	L06
4	6699926	1631578	−2,290.21	41	A0	L06
1	6699898	1631604	−2,321.55	41	A0	L06
2	6700014	1631737	−2,228.02	41	A0	L06
3	6700672	1630588	−1,399.3	41	A0	L06
4	6700556	1630454	−1,492.83	41	A0	L06
1	6700546	1630480	−1,506.49	41	A0	L06
2	6700684	1630554	−1,381.89	41	A0	L06
3	6700786	1630071	−1,206.6	41	A0	L06
4	6700648	1629997	−1,331.2	41	A0	L06
1	6700730	1631231	−1,479.62	41	A0	L07
2	6700860	1631133	−1,363.54	41	A0	L07
3	6700501	1630428	−1,561.73	41	A0	L07
4	6700371	1630527	−1,677.81	41	A0	L07
1	6700383	1630545	−1,670.64	41	A0	L07
2	6700484	1630403	−1,572.3	41	A0	L07
3	6700414	1630322	−1,617.96	41	A0	L07
4	6700313	1630464	−1,716.3	41	A0	L07

Element corner no	Northing (m)	Easting (m)	Elevation (m)	Label	Reflector ID	Profile
1	6701611	1630602	−557.75	41	A0	L08
2	6701471	1630664	−686.37	41	A0	L08
3	6701614	1631134	−617.52	41	A0	L08
4	6701755	1631072	−488.9	41	A0	L08
1	6701759	1631093	−487.34	41	A0	L08
2	6701611	1631123	−618.76	41	A0	L08
3	6701735	1631831	−595.72	41	A0	L08
4	6701883	1631801	−464.3	41	A0	L08
1	6701882	1631797	−464.69	41	A0	L08
2	6701738	1631845	−594.99	41	A0	L08
3	6701942	1632674	−516.33	41	A0	L08
4	6702086	1632626	−386.03	41	A0	L08
1	6702077	1632601	−390.71	41	A0	L08
2	6701956	1632707	−508.74	41	A0	L08
3	6702193	1633152	−355.51	41	A0	L08
4	6702315	1633046	−237.48	41	A0	L08
1	6701445	1629273	−400.99	41	A0	L11
2	6701326	1629365	−532.98	41	A0	L11
3	6701672	1630135	−311.36	41	A0	L11
4	6701791	1630043	−179.36	41	A0	L11
1	6701266	1630011	−691.32	41	A0	L12
2	6701378	1630151	−602.04	41	A0	L12
3	6701693	1629648	−212.52	41	A0	L12
4	6701581	1629508	−301.8	41	A0	L12
1	6701184	1629594	−739.41	41	A0	L13
2	6701063	1629682	−872.4	41	A0	L13
3	6701494	1630684	−601.99	41	A0	L13
4	6701615	1630596	−469	41	A0	L13

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Appendix 1

Seismic profiles with interpreted reflection events
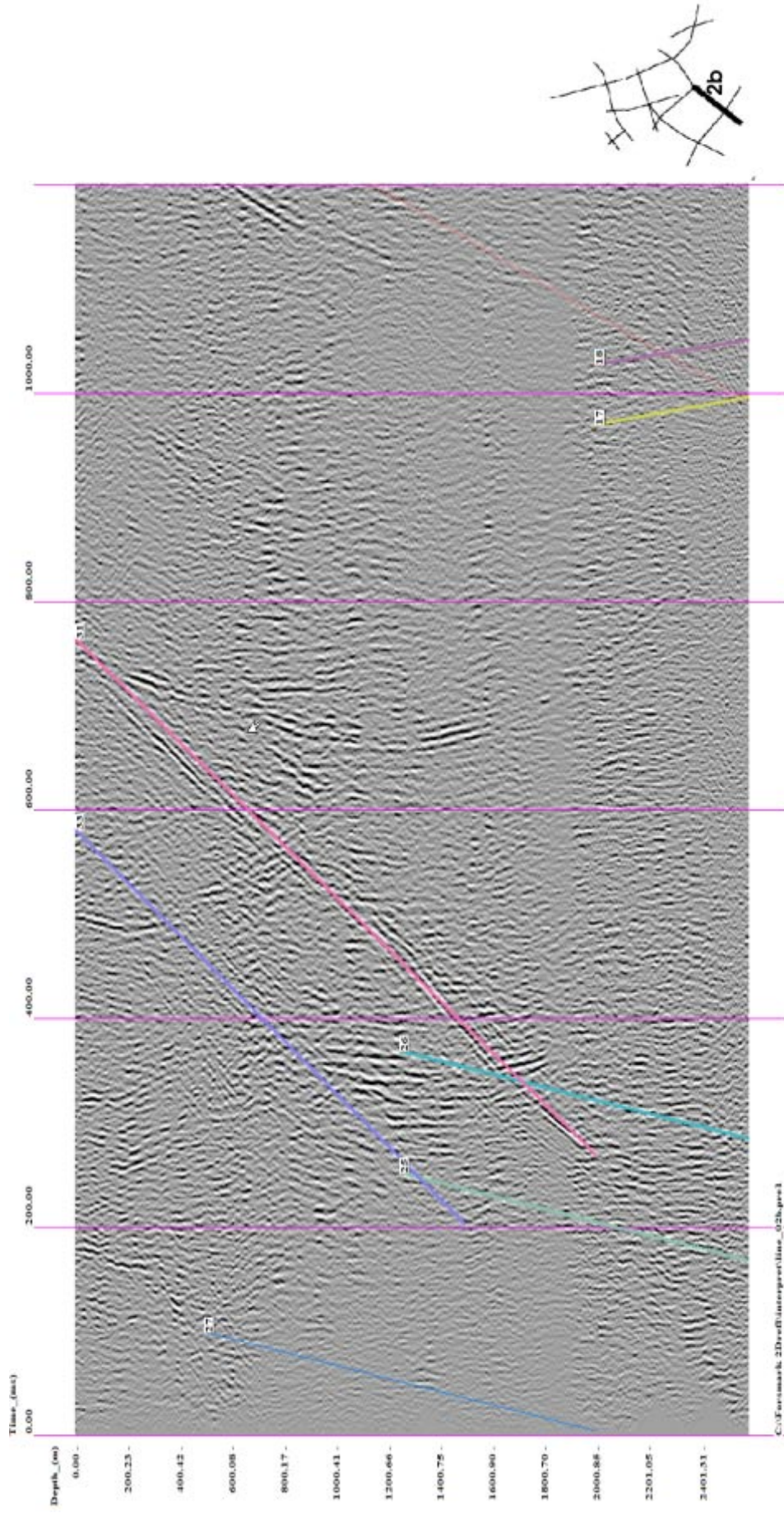
Figure A-1. Profile 2b. Reflectors: A1(1 red), C1(17 yellow), C2(18 magenta), G5(25 teal), G6(26 green), G7(27 blue), J1(31 pink), J3(33 lilac).
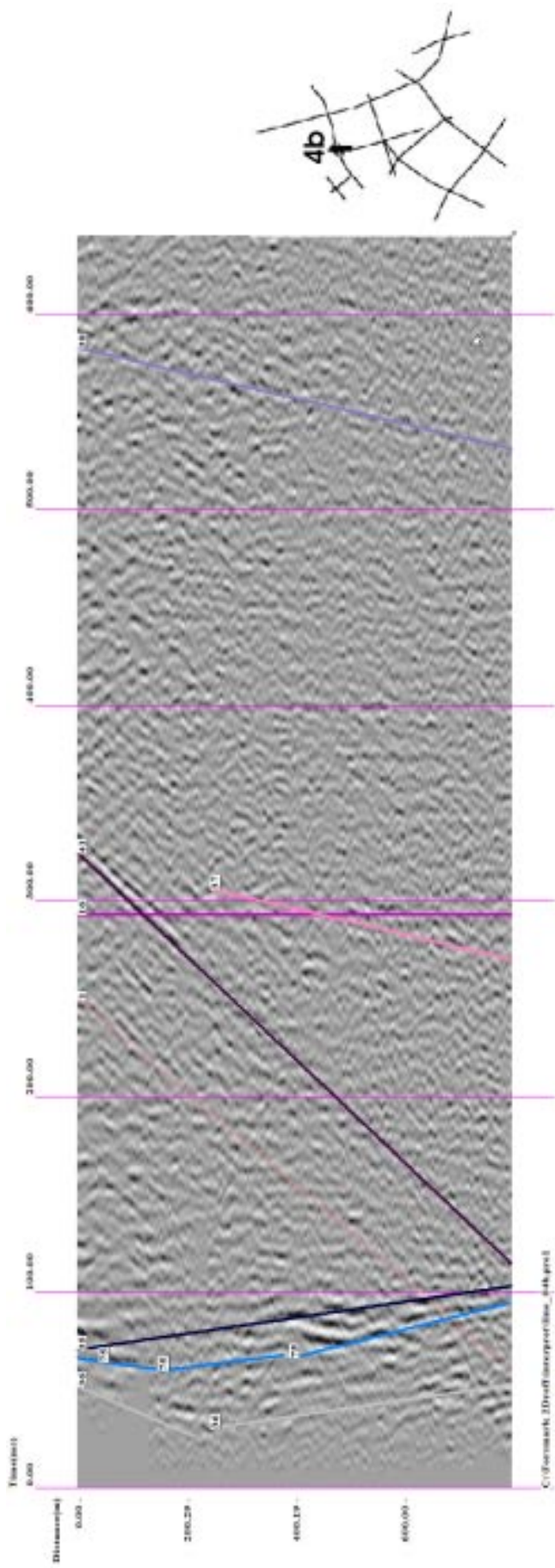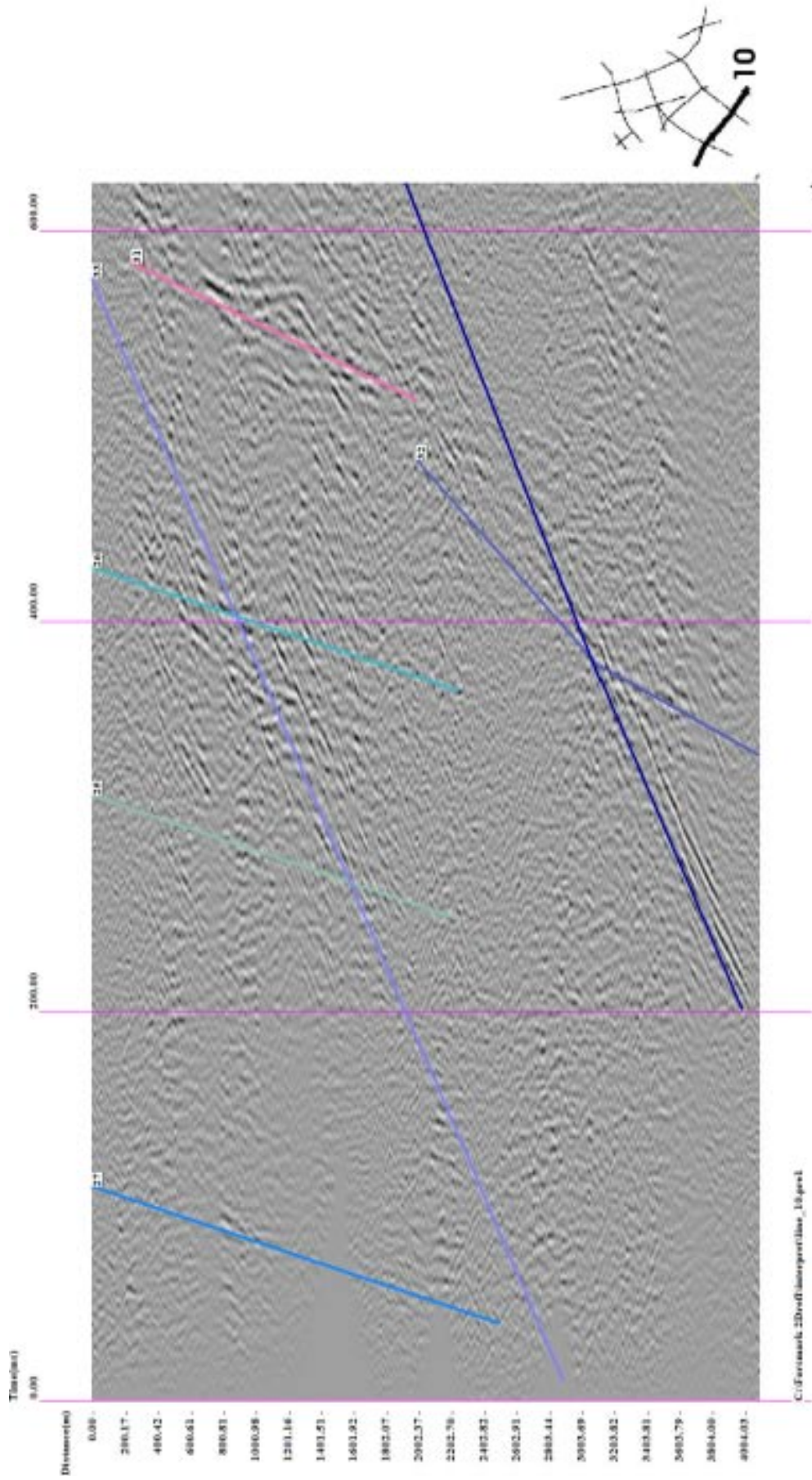
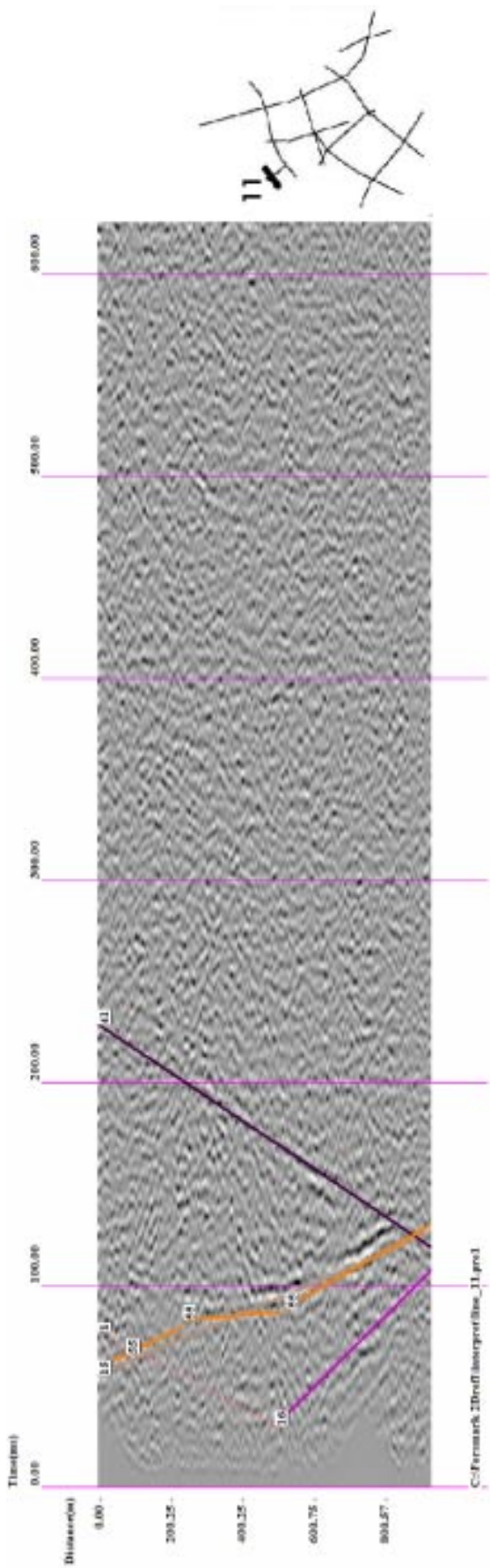***Figure A-2.*** *Profile 4b. Reflectors: A0 (41 dark brown), A1 (1 red), B9 (16 brown), L1(35 dark blue), L2(36 gray), M1 (37 red), M2 (38 light blue). An alternative interpretation for reflector L1 is given as a curved reflector group (75 blue).*

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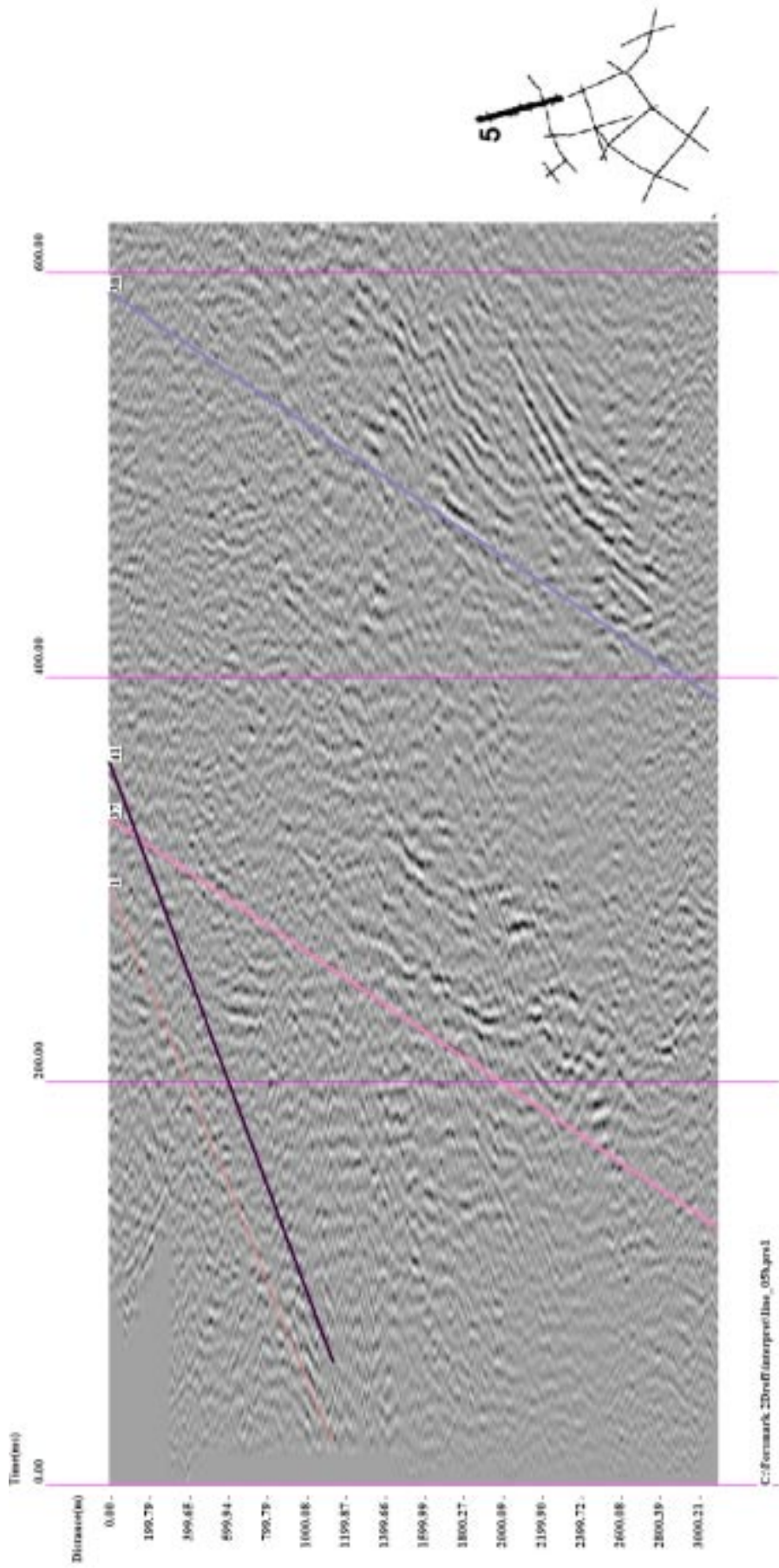
Figure A-3. *Profile 5b. Reflectors: A0 (41 dark brown), A1 (1 red), M1 (37 red), M2 (38 light blue).*
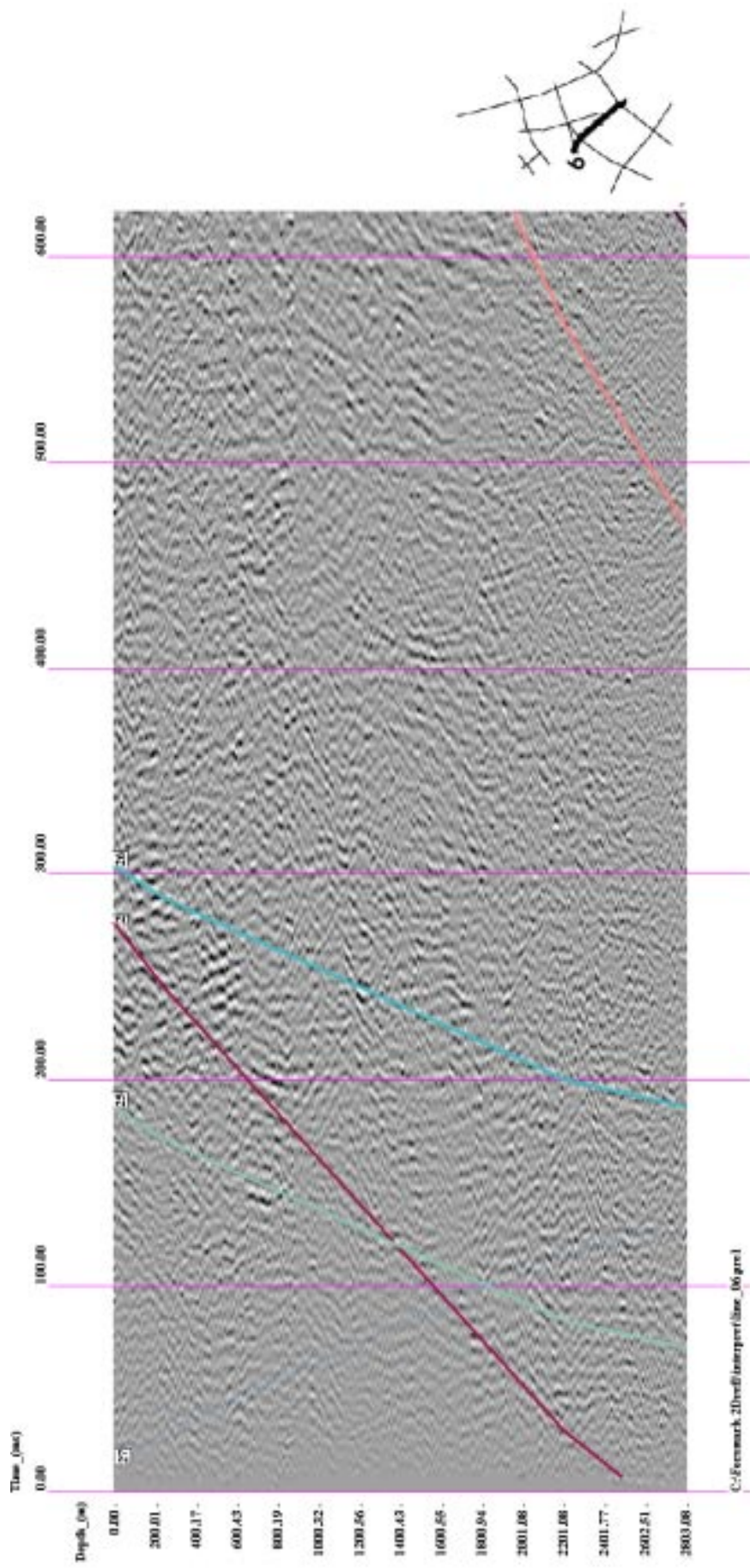
Figure A-4. Profile 6. Reflectors: A2(2 dark red), G5(25 teal), G6(26 green).
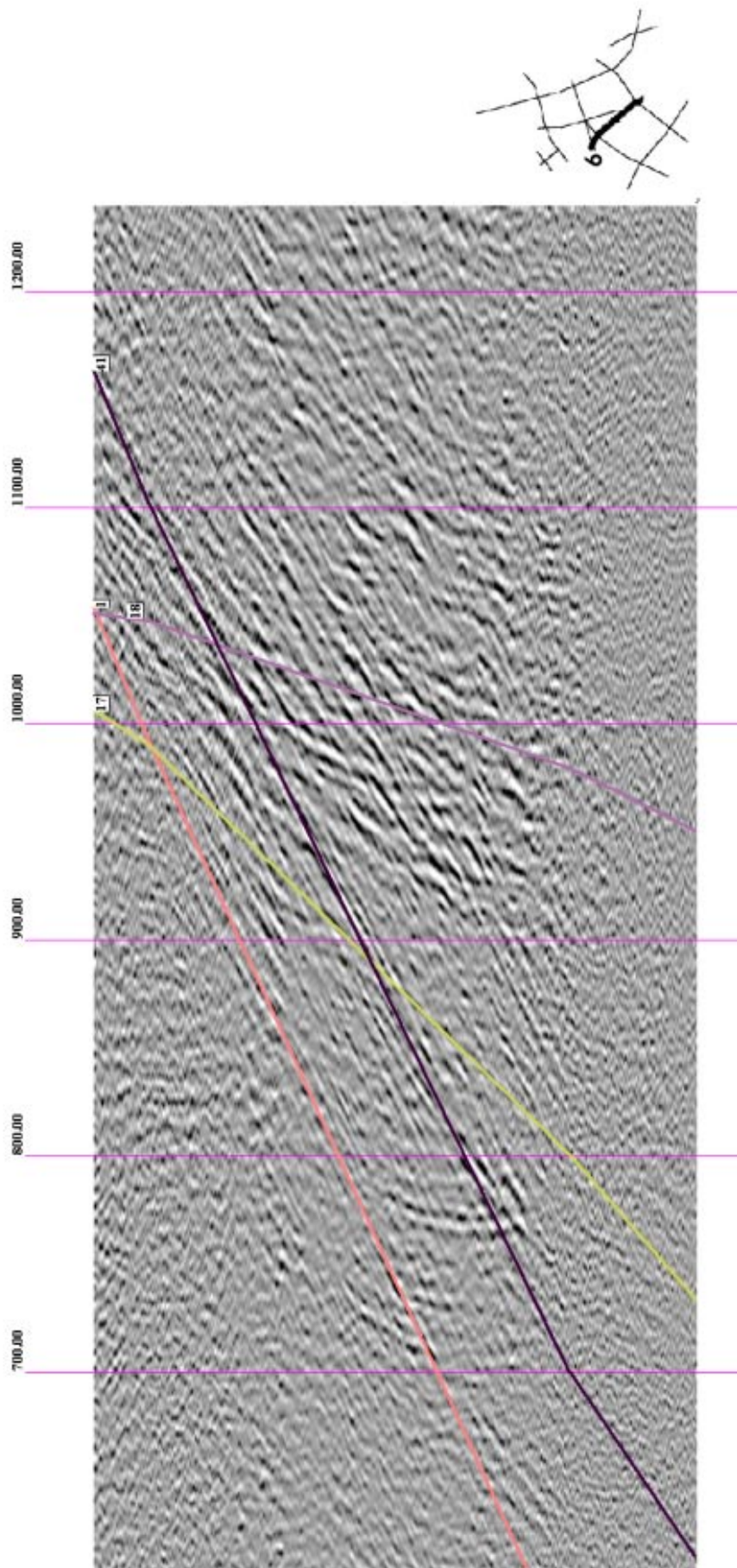
Figure A-5. *Profile 6, part 2 (from 600 ms). Reflectors: A0(41 dark brown), A1(1 red), C1(17 yellow), C2(18 magenta).*
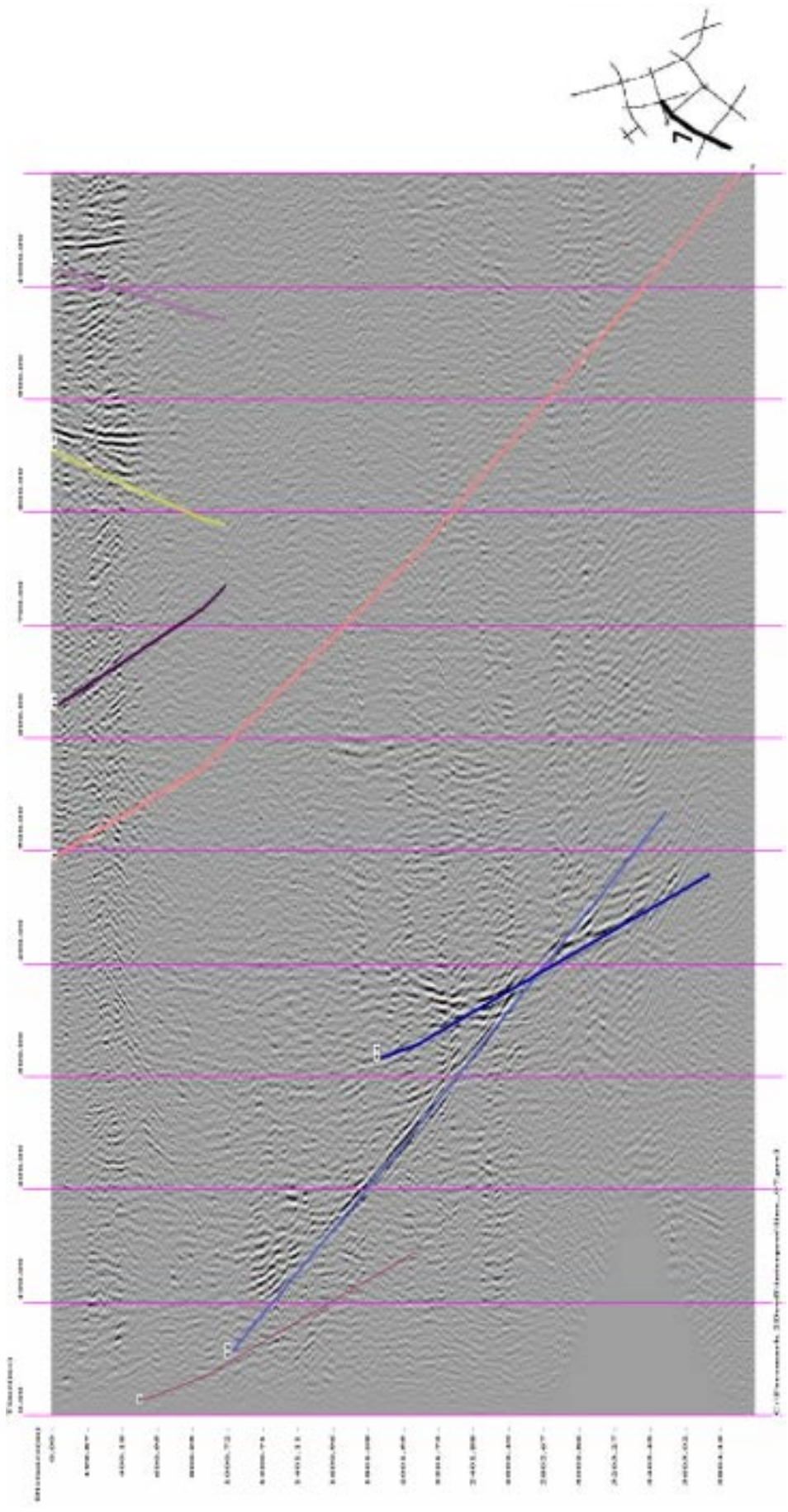
Figure A-6. *Profile 7. Reflectors: A0(41dark brown), A1(1 red), A2(2 dark red), C1(17 yellow), C2(18 magenta), J2 (32 blue), K1(34 dark blue).*
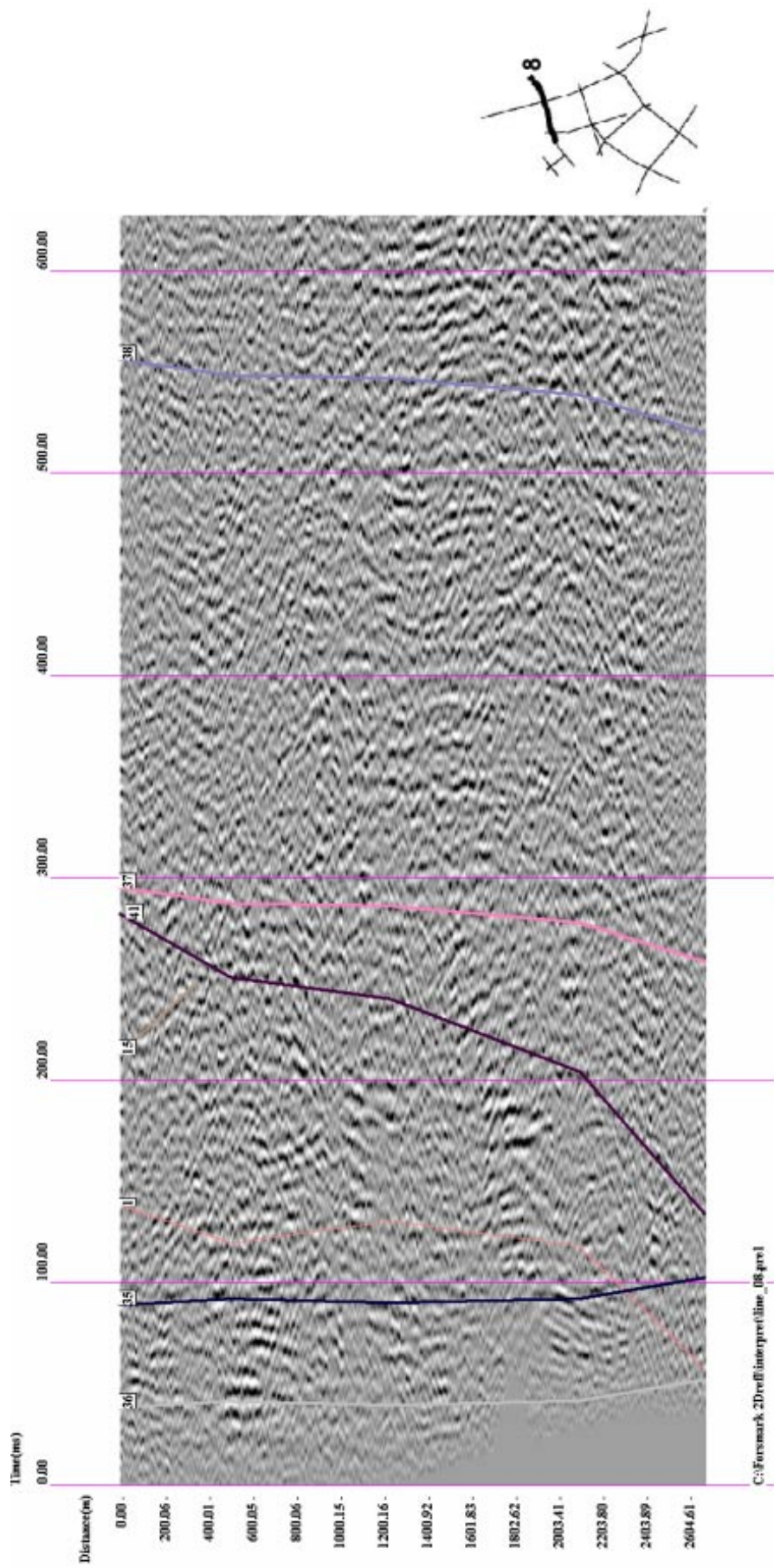
Figure A-7. *Profile 8. Reflectors: A0 (41 dark brown), A1 (1 red), B8 (15 brown), L1(35 dark blue), L2(36 gray), M1 (37 red), M2 (38 light blue).*
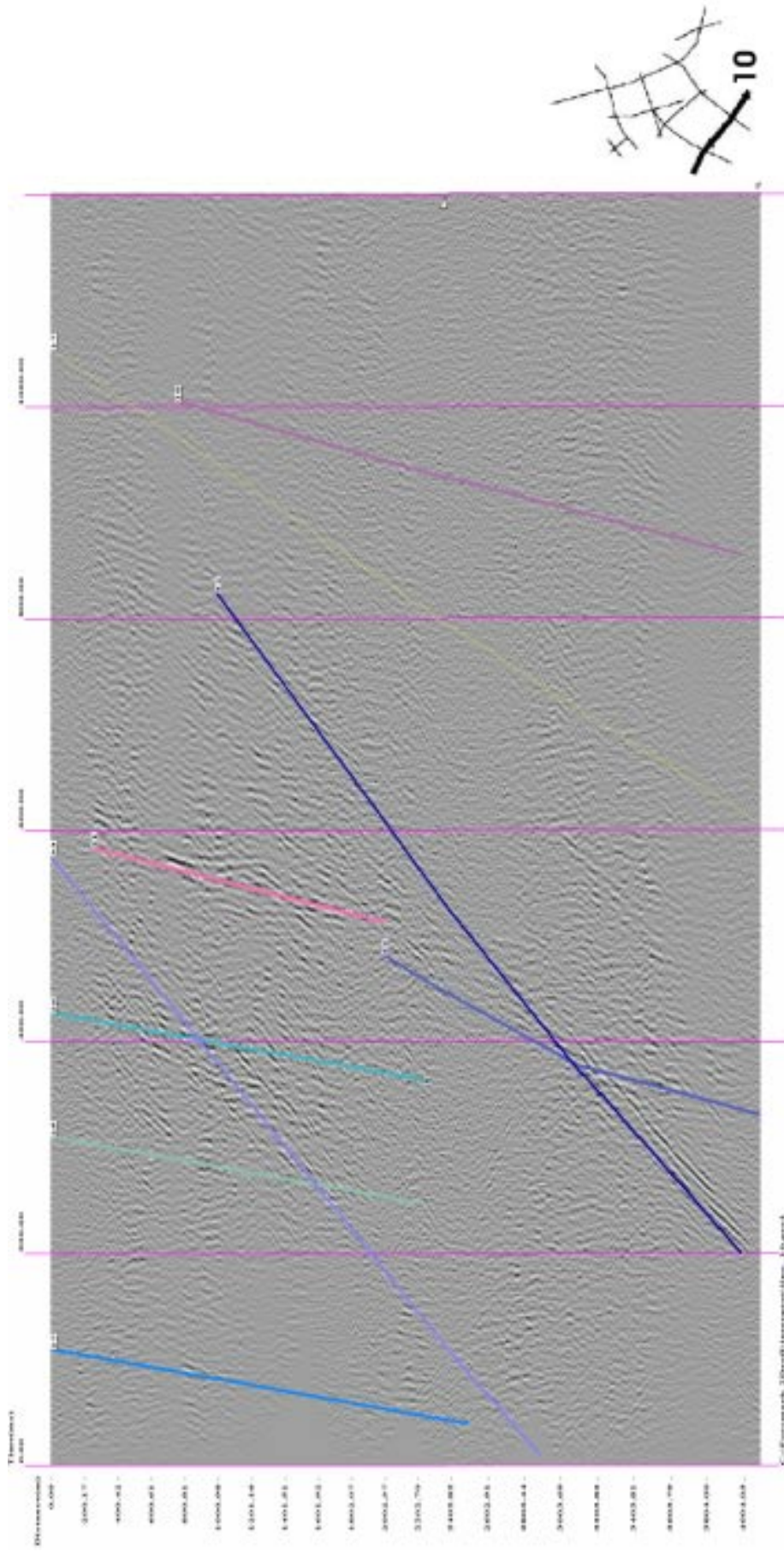
Figure A-8. *Profile 10. Reflectors: C1(17 yellow), C2(18 magenta), G7(27 cyan), G5(25 teal), G6(26 green), J1(31 pink), J2(32 blue), J3(33 lilac), K1(34 dark blue).*
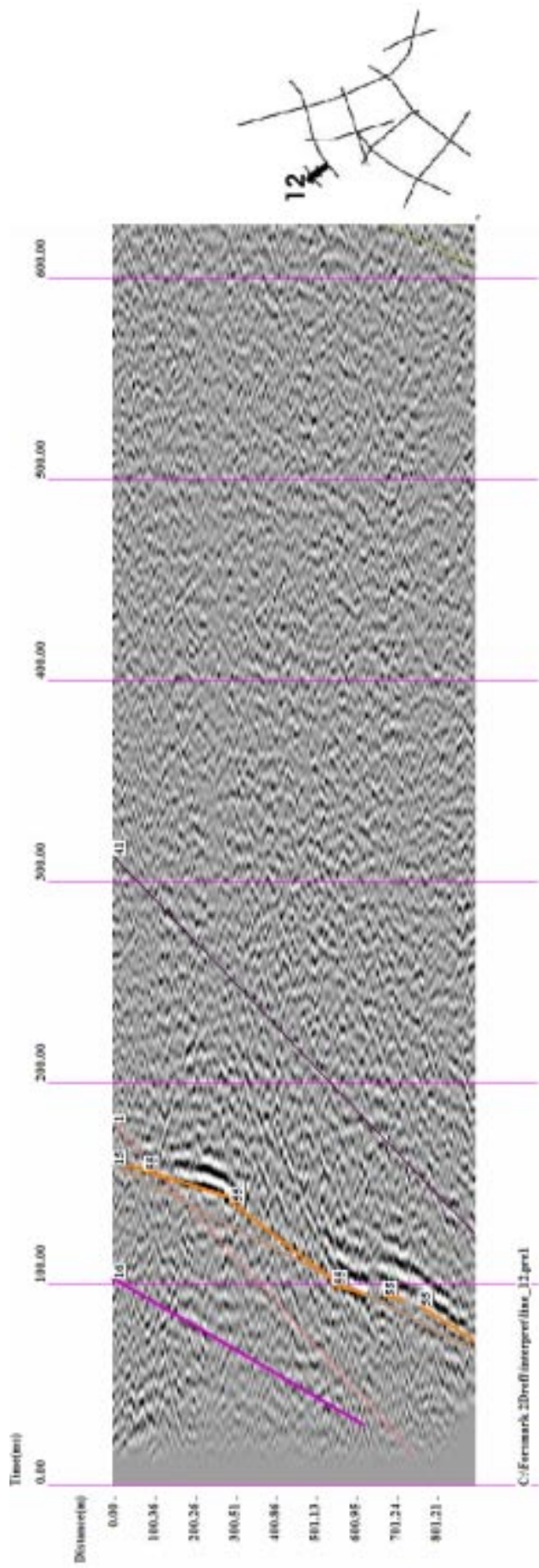
Figure A-9. *Profile 10 (detail). Reflectors: G7(27 cyan), G5(25 teal), G6(26 green), J1(31 pink), J2(32 blue), J3(33 lilac), K1(34 dark blue).*
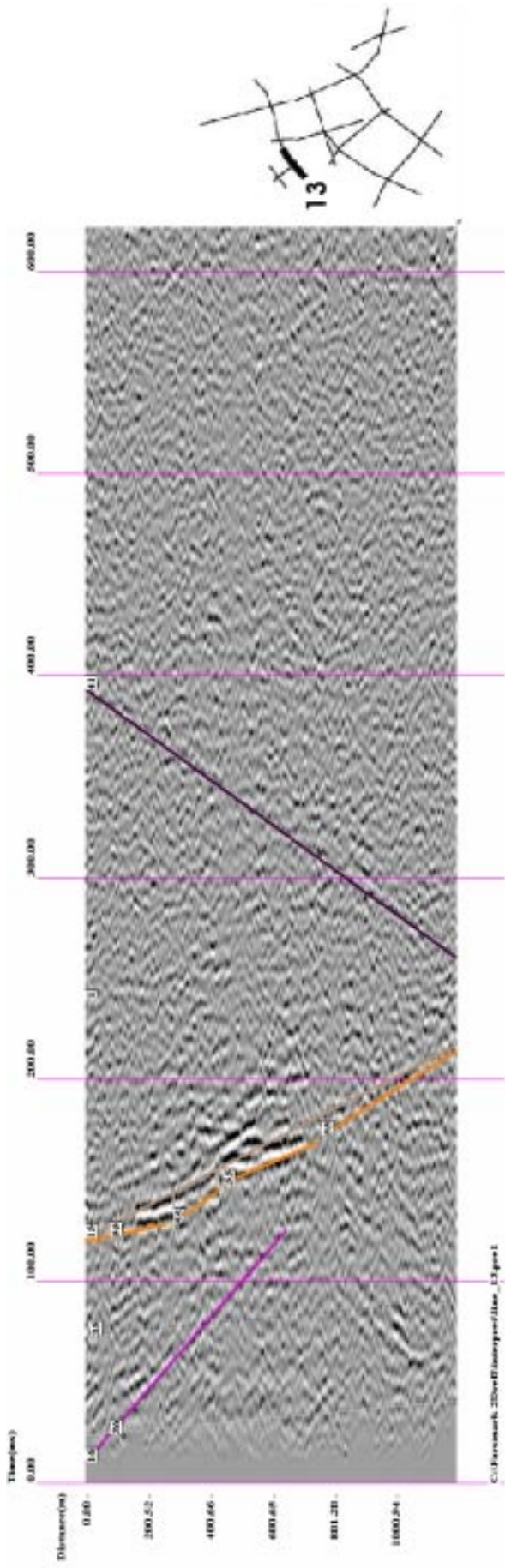
Figure A-10. *Profile 11. Reflectors: A0 (41 dark brown), A1(1 red), B8(15 brown), B9(16 magenta).*
An alternative interpretation for reflector B8 is given as a curved reflector group (55 orange).

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Figure A-11. *Profile 12. Reflectors: A0 (41 dark brown), A1(1 red), B8(15 brown), B9(16 magenta).*
An alternative interpretation for reflector B8 is given as a curved reflector group (55 orange).

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Figure A-12. *Profile 13. Reflectors: A0 (41 dark brown), B8(15 brown), B9(16 magenta), L1(35 blue), L2(36 gray). An alternative interpretation for reflector B8 is given as a curved reflector group (55 orange).*

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