



Sample report – Conveyor Belt Condition Monitoring

Rev	Description	Compiled by	Date
A	Belt Condition Report	Engineer ID	11-10-2017



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1. Recommendations and Findings

1.1 Recommendations

It is recommended that the following action be initiated on this conveyor. The number assigned to any recommendation is an indication of its priority. No. 1 assumes highest priority.

1. Replace Splice 35 if not already done.
2. Splice out Event 5.
3. Replace Splice 22.
4. Replace Section A if not already done.
5. Redo the repairs at Events 1 and 4.
6. Whenever punctured covers are encountered such as in Section B, repairs must be effected to prevent ingress of moisture.
7. Replace Section C.
8. Replace Splice 53.
9. Re-scan the conveyor after a further 6 months of normal operation to verify the repairs, identify new damage and to detect any growth in the old damage.

It is recommended that each splice should be able to be identified by a unique marking be it a number, date, order no etc. Some splices have the same markings such as those done on the same day. These should be differentiated in some way.

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1.2 Summary of Findings

The belting was scanned on 22nd March 2017.

Variance in belt ratings, cover thickness and brands.

Sections with ST850, ST1000 and even ST1600 ratings were noted. Apart from deviating from the original design parameters, this discrepancy has an effect on, amongst others, power draw and starting dynamics.

The differing ratings have different elasticity, cable count and diameters and different weight per metre. These differences also present challenges when splicing.

Pulley diameter, carrying capacity, power specification, take-up mass and starting dynamic are just some of the considerations when specifying belt class. It should be endeavoured to standardise the belt specification.

It was also noted that there are multiple instances of what is almost certainly **entrapment damage**.

Material gets lodged between a pulley and the belting resulting in repeated damage of fixed frequency in the same plane of the belting. Apart from damaging the steel cords, it can cause puncturing of the covers allowing the ingress of moisture. This will ultimately result in corrosion and weakening of the cords.

All measures and precautions should be taken to prevent product spillage along the length of the conveyor and at the on and off load points.

Belt Condition

The overall condition of the belting is fair. There is a mix of good and poor sections of belting.

There are **3 damage events** requiring attention.

The most severe event (Event 5) has damage affecting up to 20 % of the full belt width at the edge of the belting. There is a section missing and a lateral tear. This event should be spliced out.

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The other 2 events are old repairs that need re-doing. Where possible, hot press repairs should be used instead of patches. After a period of use, patches tend to come loose and are prone to scraper damage.

There are **3 Sections** of belting that need attention:

Section A, 63 m from Splice 6 to Splice 9 including Splices 7 and 8.

There are multiple damage events and splices which are close to each other. This section was scheduled to be replaced the day of the scan. If not done, it should be replaced as soon as possible.

Section B, a 72 m portion of belting within the section running from Splice 19 to Splice 20.

This section was identified as being a typical example of entrapment damage. In this section and wherever such punctured covers are located, each damage instance must be repaired to prevent ingress of moisture.

Section C, 41 m from Splice 30 to Splice 32 including Splice 31.

This section has old, damaged belting with numerous small damage events, some with punctured covers. Splice 31 and the adjacent belting have been patched at the edge. Splice 32 and the adjacent belting have edge damage. The section should be replaced at a lower priority.

Apart from the damage listed above, there is other, less severe damage, but none that needs immediate attention.

Splice Condition

There are **4 splices** needing attention / inspection.

Three splices, 22, 35 and 53, must be replaced. (Splice 35 was scheduled to be replaced on the day of the scan and should be replaced if not already done.) The other splice, 15, needs to be monitored on a regular basis.

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Cover Condition

Apart from the damage described above, both carry and pulley covers appear to be in a reasonable condition.

Tracking

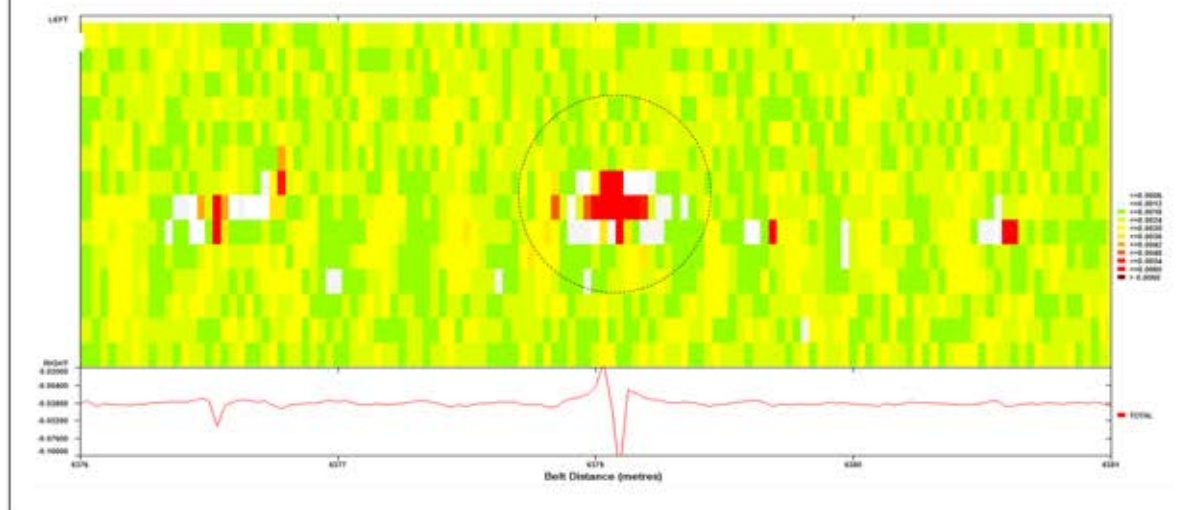
It was noted that belt mistracking was address through the use of near vertical idlers. See photograph. This method has potential to harm the edges of the belt after prolonged contact between these idlers and the belting. Self-tracking idler sets are a preferable solution.



2. Damage Identification

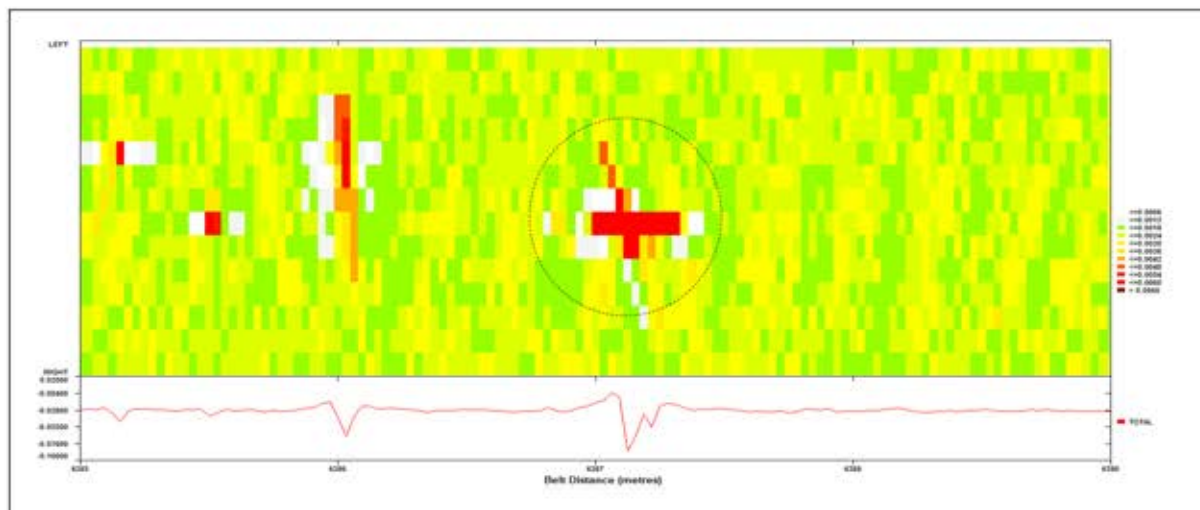
2.1 Events

Event	Location	Findings
1	19 m after splice 3 marked 18-03-17 towards splice 4 marked BR16-5-12.	There are broken / damaged cords in the centre of the belt. Up to 17 % of the full belt width is affected. There is an old patch in place. The repair should be redone.

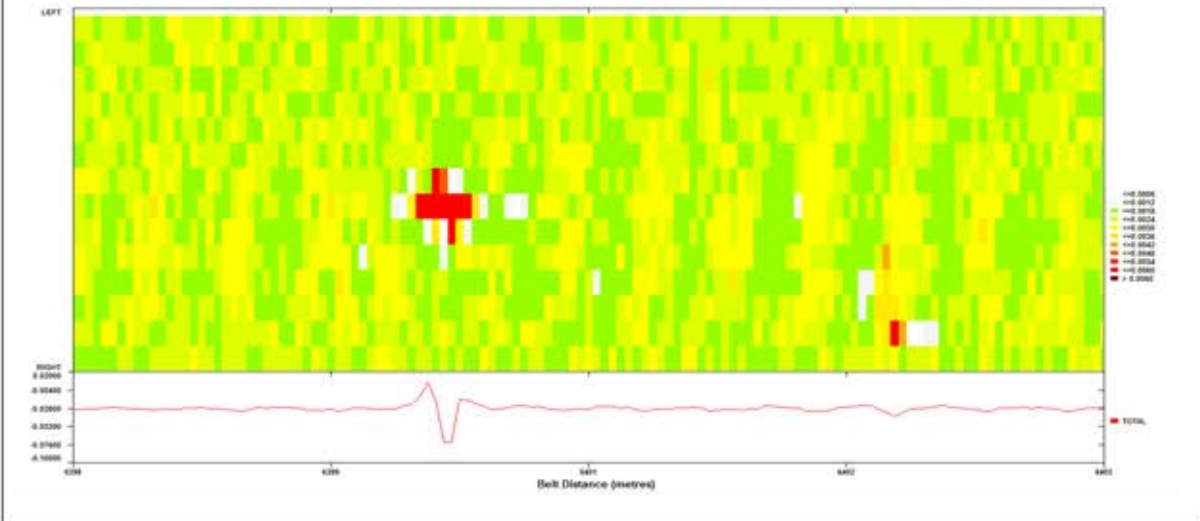


Event	Location	Findings
2	28 m after splice 3 marked 18-03-17 towards splice 4 marked BR16-5-12.	<p>There are broken / damaged cords in the centre of the belt. Up to 17 % of the full belt width is affected.</p> <p>Repair of the damage was in progress at the time of the scan. It is assumed that the repair has been completed.</p>





Event	Location	Findings
3	40 m after splice 3 marked 18-03-17 towards splice 4 marked BR16-5-12.	<p>There are broken / damaged cords in the centre of the belt. Up to 17 % of the full belt width is affected.</p> <p>Repair of the damage was in progress at the time of the scan. It is assumed that the repair has been completed.</p>

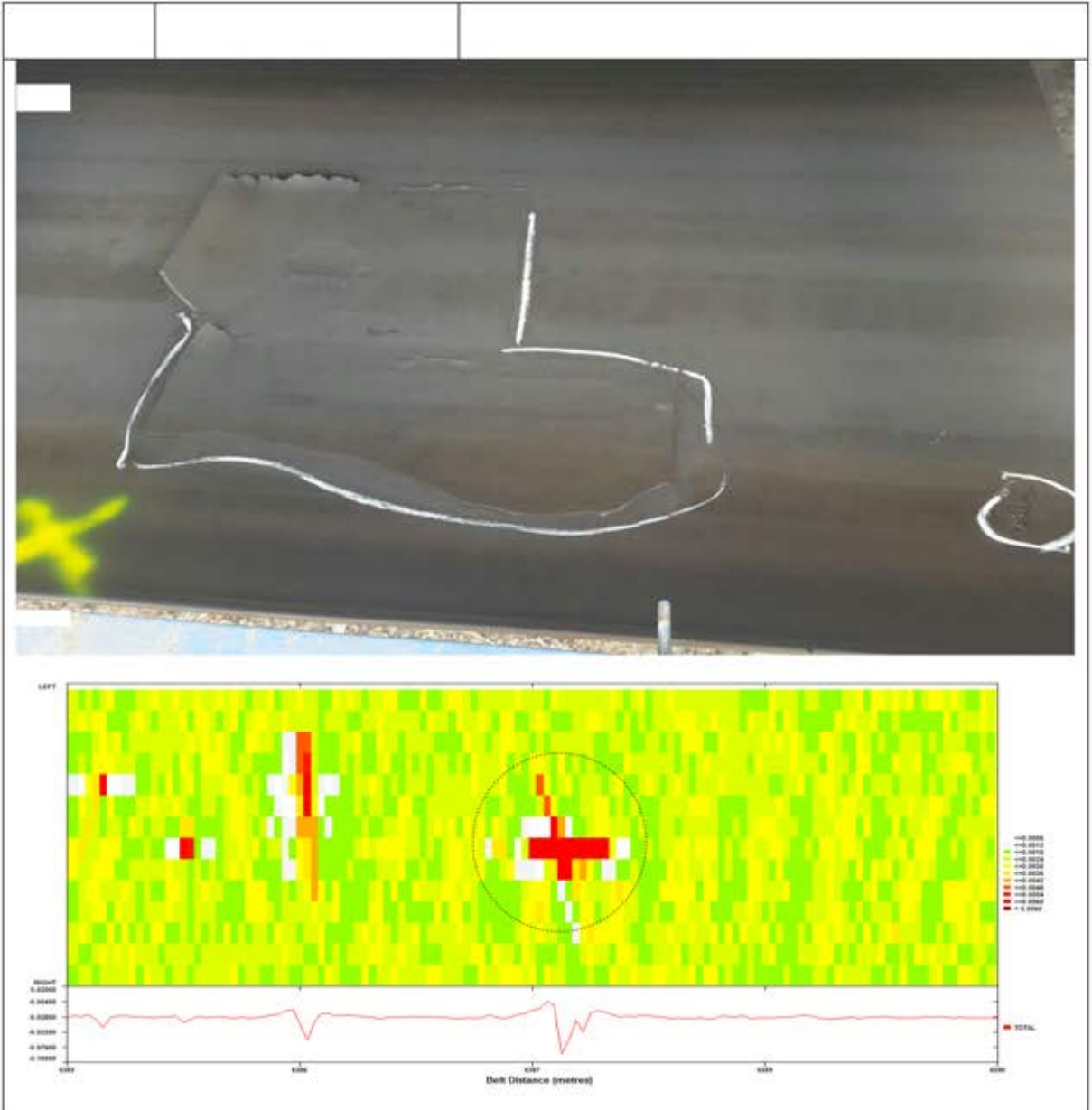


Event	Location	Findings
4	2 m behind splice 10 marked 2028GY towards splice 9 marked 12-10-05 ceza.	There are broken / damaged cords in the right side of the belt. Up to 17 % of the full belt width is affected. There is a patch which is coming loose. The repair should be redone.



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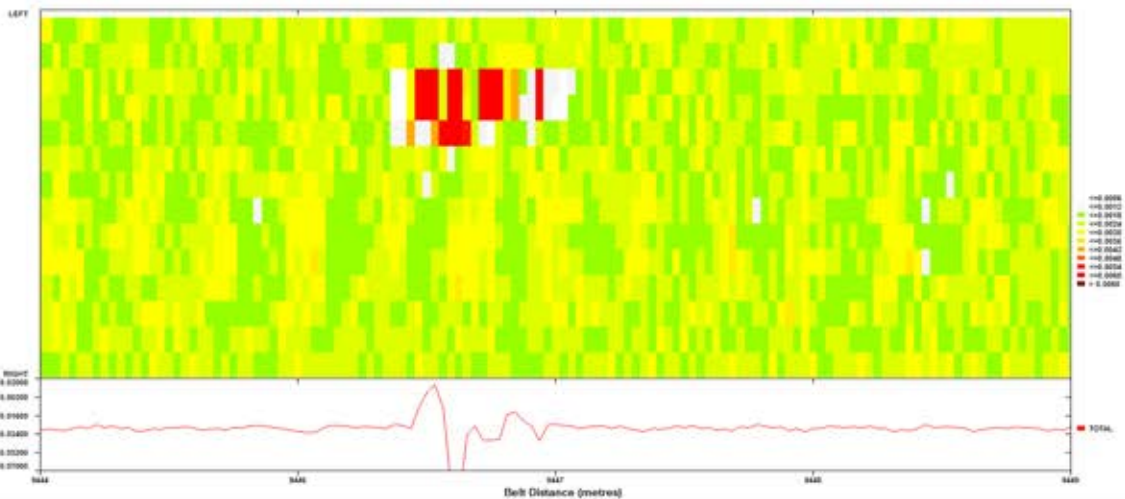


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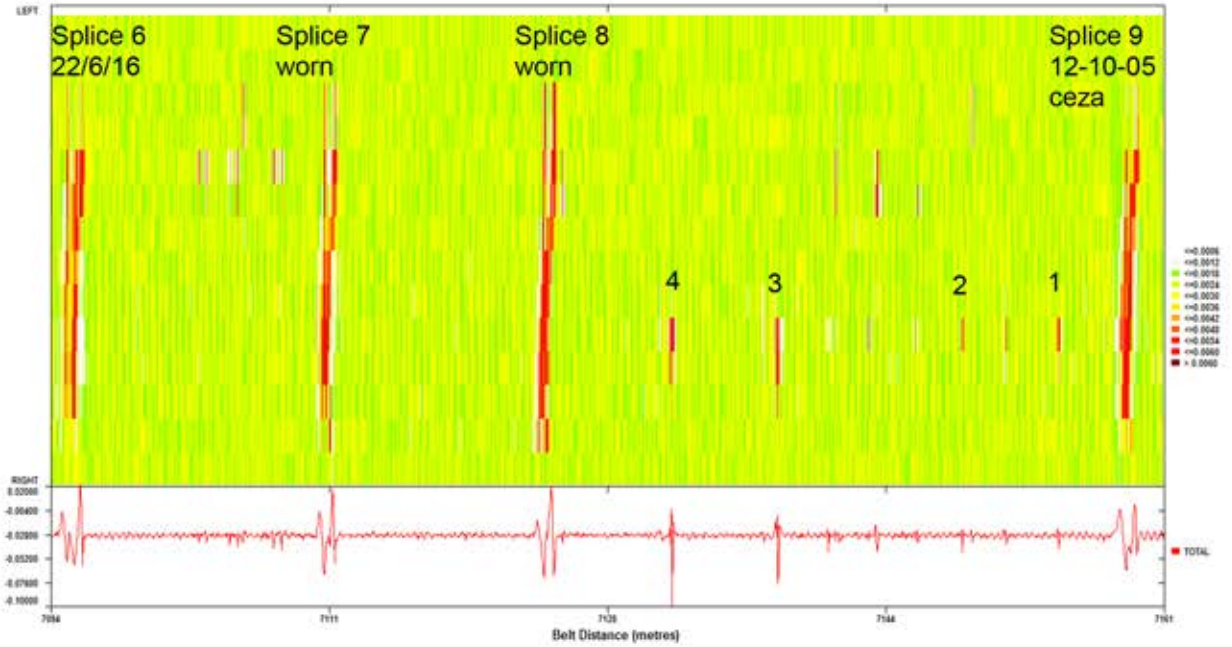
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Event	Location	Findings
5	9m behind splice 34 marked BR 8-11-11 towards splice 33 marked 29-5-14.	<p>There are broken / damaged cords at the edge of the belt. Up to 20 % of the full belt width is affected. A section of the belting is missing and the belting is torn.</p> <p style="color: red;">The event should be spliced out.</p>



2.2 Sections



Section A showing multiple damage events including those in the photos below. This section was being replaced at the time of the scan.



Photo 1

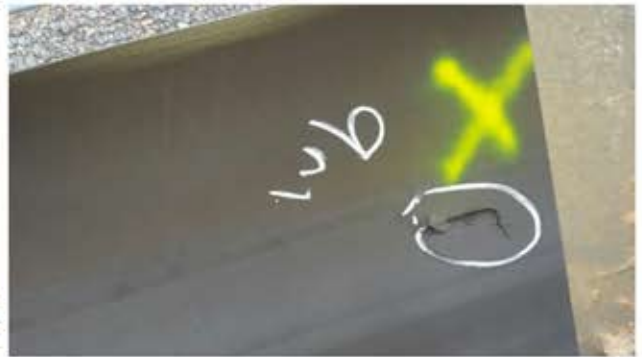


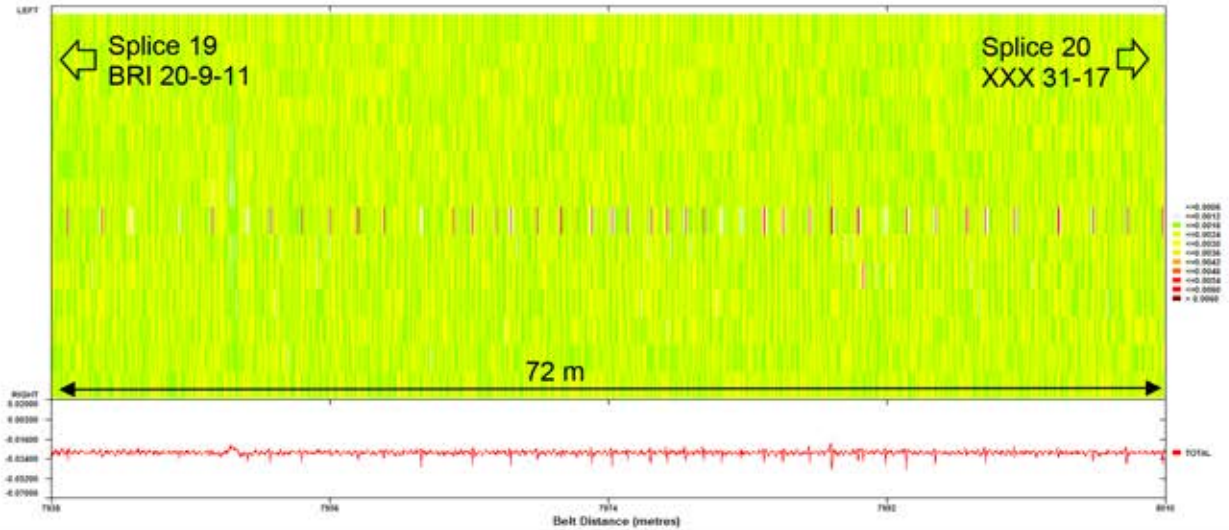
Photo 2



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Photo 3

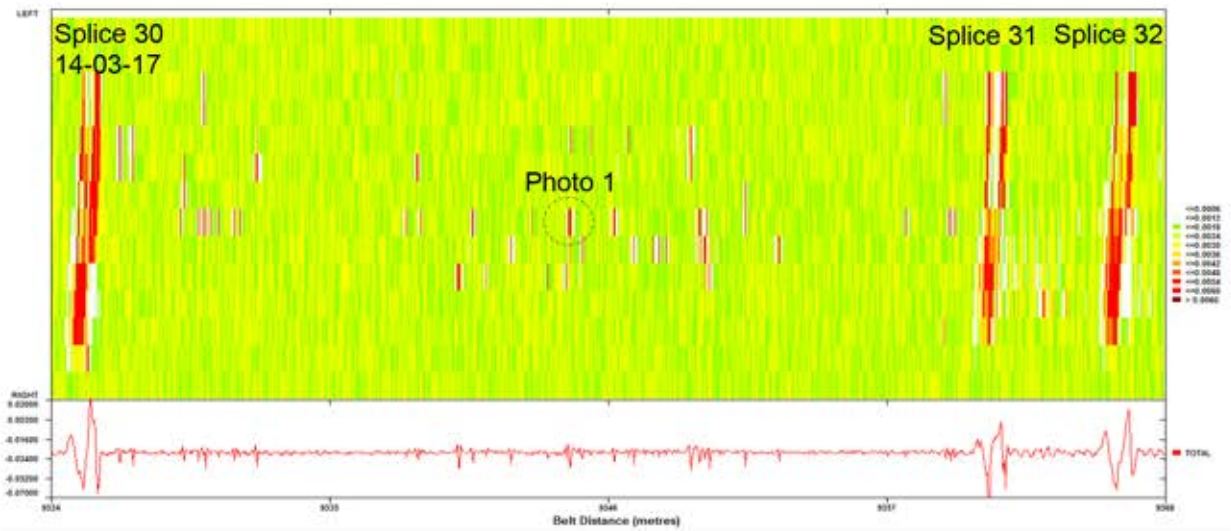
Photo 4



Section B showing damage most likely caused by entrapment. Starting 51 m after Splice 19 for approx. 72 m in the direction of Splice 20. The regular size, location and frequency indicate entrapment between belting and pulley to be the cause of the damage. Although less than 10 % of the full width of the belt is affected in each instance, the covers are being punctured allowing for ingress of moisture and subsequent corrosion setting in. See photographs.

Where the covers are punctured, repairs must be effected to prevent ingress of moisture. The entrapment of material between belting and pulleys should be investigated and minimized.





Section C showing damage to the old belting between Splices 30 and 31. The belting is punctured in several locations. Splice 31 and the belting immediately adjacent have been patched. Splice 32 and the belting immediately adjacent have edge damage. **The section should eventually be replaced at a lower priority.**



Splice 31



Splice 32



Photo 1

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2.3 Splices

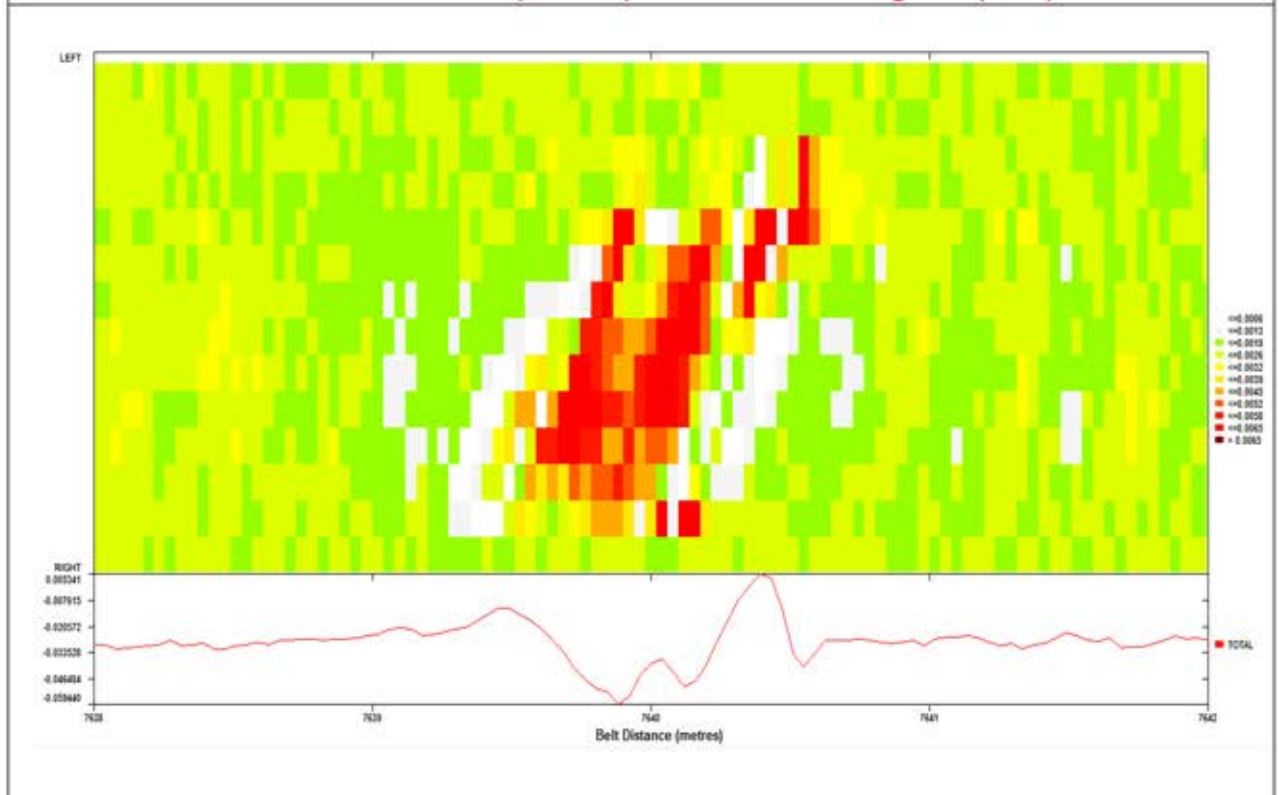
Based on the splice magnetic signatures made and visual inspection where possible, all the splices were found to be in acceptable condition **except for the following:**

Splice 15 (worn markings)

The splice signature shows an acceptable pattern for a single stage splice.

Visual inspection revealed small air pockets under the covers.

No immediate action is necessary, the splice should be regularly inspected.



Splice 22 (RTT.. worn markings)

The splice signature shows a normal pattern for a single stage splice:

Visual inspection revealed a large section of cover being ripped off from the leading skive back.

The splice should be replaced.



Splice 35(BR 1-06-10)

The splice signature shows a normal pattern for a single stage splice.

However, visual inspection revealed damage to the trailing skive of the splice. The cover is punctured and the underlying steel cords are broken and protruding.

The splice was scheduled to be replaced on the day of the scan. If it was not replaced, it should be done ASAP.



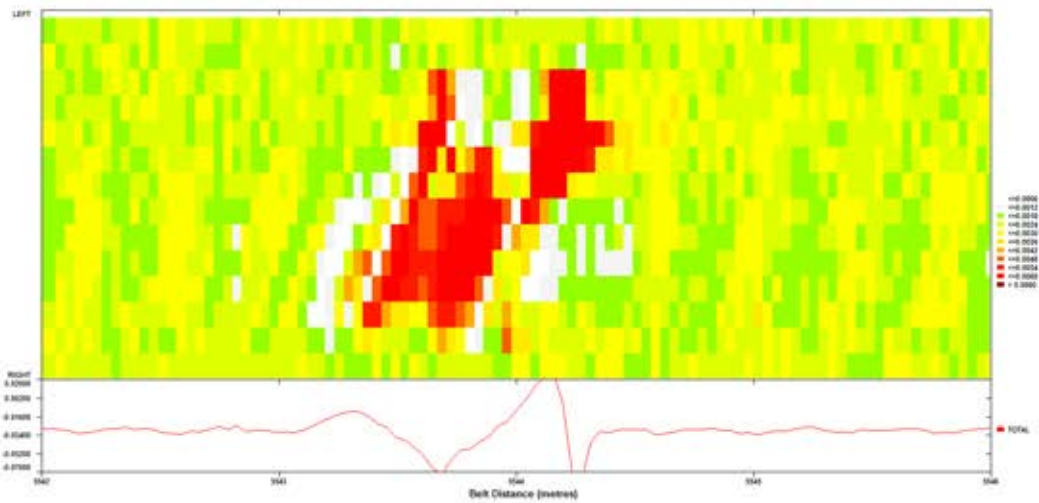
Splice 53 (worn markings)

The splice signature shows an abnormal pattern for a single stage splice.

Damage is indicated in the left section of the splice.

Visual inspection showed the splice to old and worn with edge damage.

The splice should be replaced at a lower priority.





3. Technical Specification

3.1 General Information

Client -----
 Location of Belt -----
 Belt Identification -----
 Scanner -----
 Data Analyst -----

3.2 Conveyor Details

Product -----	Coal
Belt Turnover -----	Yes
Tramp Metal Detector -----	
Tramp Metal Extractor -----	Yes at Tail
Conveyor Profile -----	Overland

3.3 Belt Specifications

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Supplier -----	Mix	
Belt Rating -----	Mix – 850/1000/1600	N/mm
Belt Width -----	1050	mm
Belt Length -----	Approx. 6900	m
Belt Speed -----	3,8	m/s
Carry Cover Thickness -----	mix 5/4	mm
Pulley Cover Thickness -----	mix 5/4	mm
Number of Splices -----	55	
Splice Make-up -----	Single / Double	Stage



3.4 Splice Identification and Belt Section Lengths

The following table shows the approximate lengths for each of the belt sections and the splice identification. Please note that the section measurements include the half a length of splice at both ends.

Splice numbers have been allocated in numerical order for ease of reference. These are not found on the belting. Actual splice markings on the belt, where found, are shown.

From Splice	Splice Marking	To Splice	Section Length (m)	Comments
1 new	18-03-17	2	119	
2 new	18-17	3	297	
3 new	18-03-17	4	55	Ev 1, Ev 2, Ev 3
4	BR16/05/12	5	254	
5		6	427	
6	22-6-16 R	7	16	Section A
7		8	13	Section A
8		9	34	Section A
9	12-10-05 ceza	10	108	Ev 4
10	2028 GY	11	17	
11		12	98	
12		13	101	
13		14	94	
14		15	63	
15		16	89	Monitor Splice
16		17	55	
17	BR 6-9-11	18	28	
18		19	76	
19	BRI 20-9-11	20	296	Section B
20 new	Xxx 31-17	21	34	
21		22	41	
22	RTT...	23	112	Damaged splice
23		24	33	
24		25	380	



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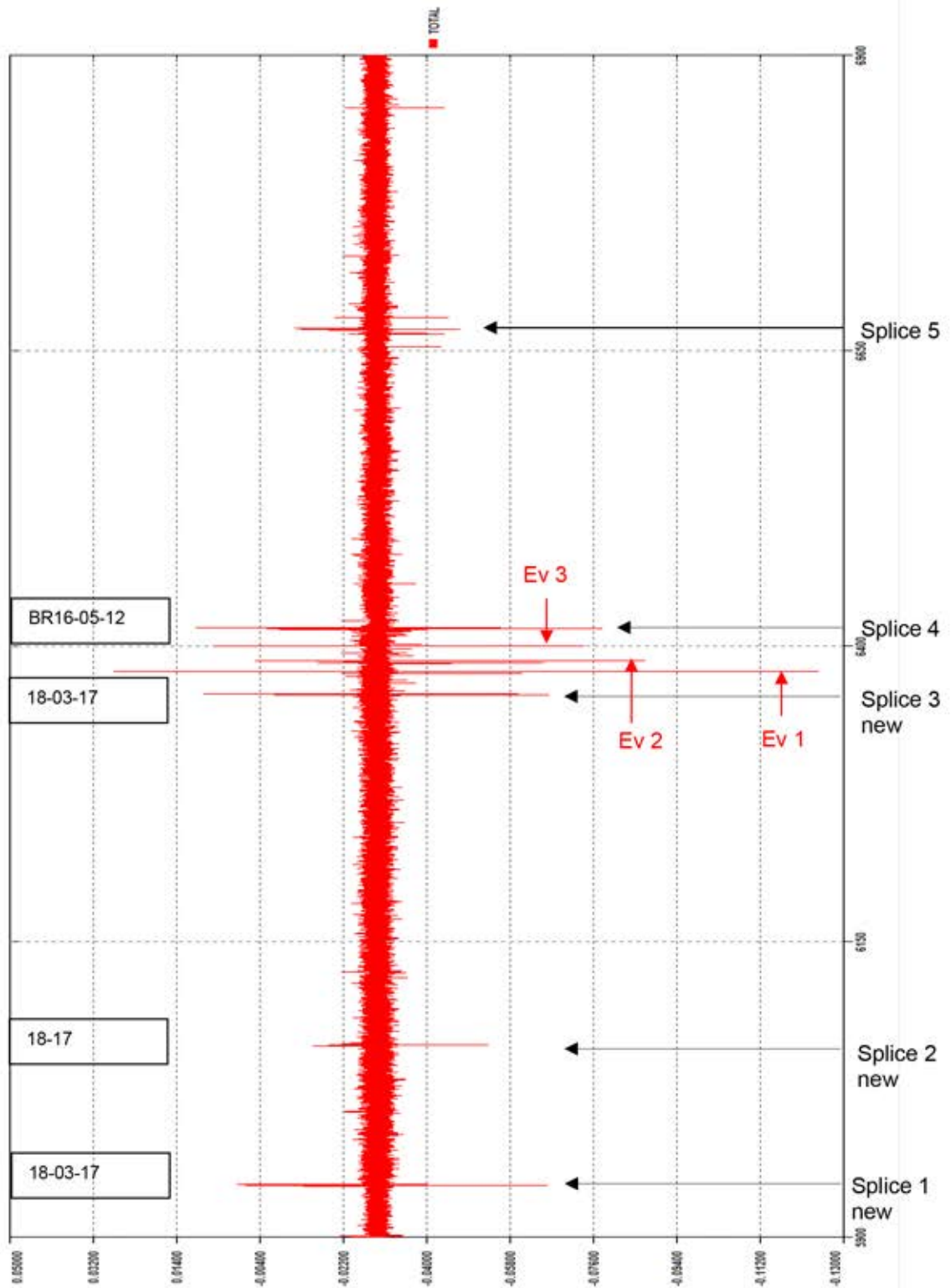
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From Splice	Splice Marking	To Splice	Section Length (m)	Comments
25 new	12-03-17	26	57	
26	10-04-13	27	65	
27	BR 23-10-13	28	184	
28		29	30	
29		30	206	
30 new	14-03-17	31	36	Section C
31		32	5	Section C, Patched Splice
32		33	55	Damaged Splice
33	X 29-5-14	34	35	Ev 5
34	BR 8-11-11	35	15	
35	BR 1-6-10	36	276	Damaged Splice
36	29-05-0?	37	51	
37 new	21-03-17 X	38	29	
38		39	78	
39	Afri Splice	40	276	
40 new	X 15-3-17	41	291	
41 new	XXX 15-3-17	42	231	
42 new	R	43	40	
43 new	17-3-17	44	304	
44 new	XXX 17-3-17	45	50	
45	RTT 26-7-16	46	301	
46		47	95	
47	XXX -12	48	254	
48		49	99	
49		50	53	
50	XXX 18-17	51	57	
51 new?		52	503	
52 new	13-03-17	53	222	
53		54	44	Damaged Splice
54		55	251	
55		1	105	



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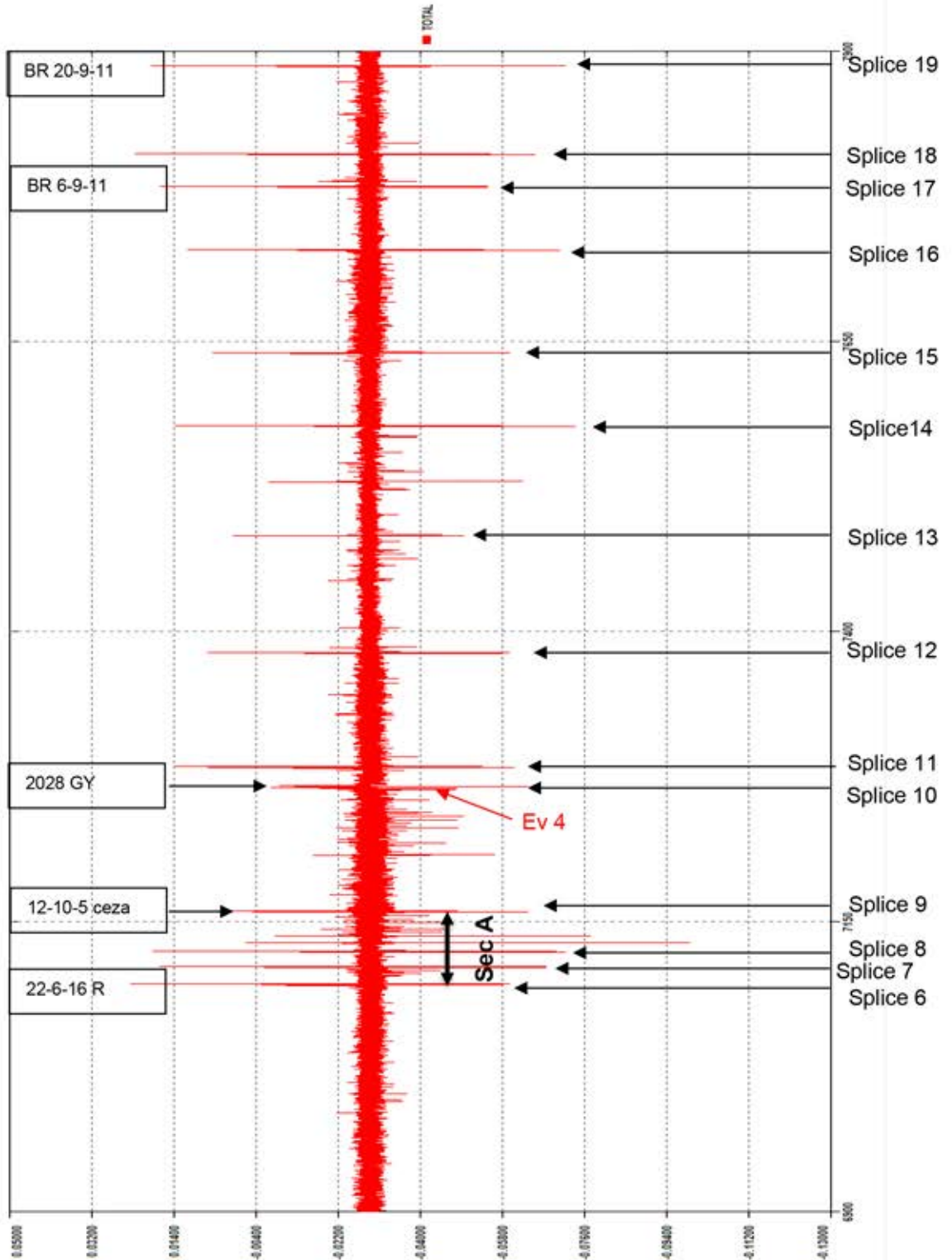
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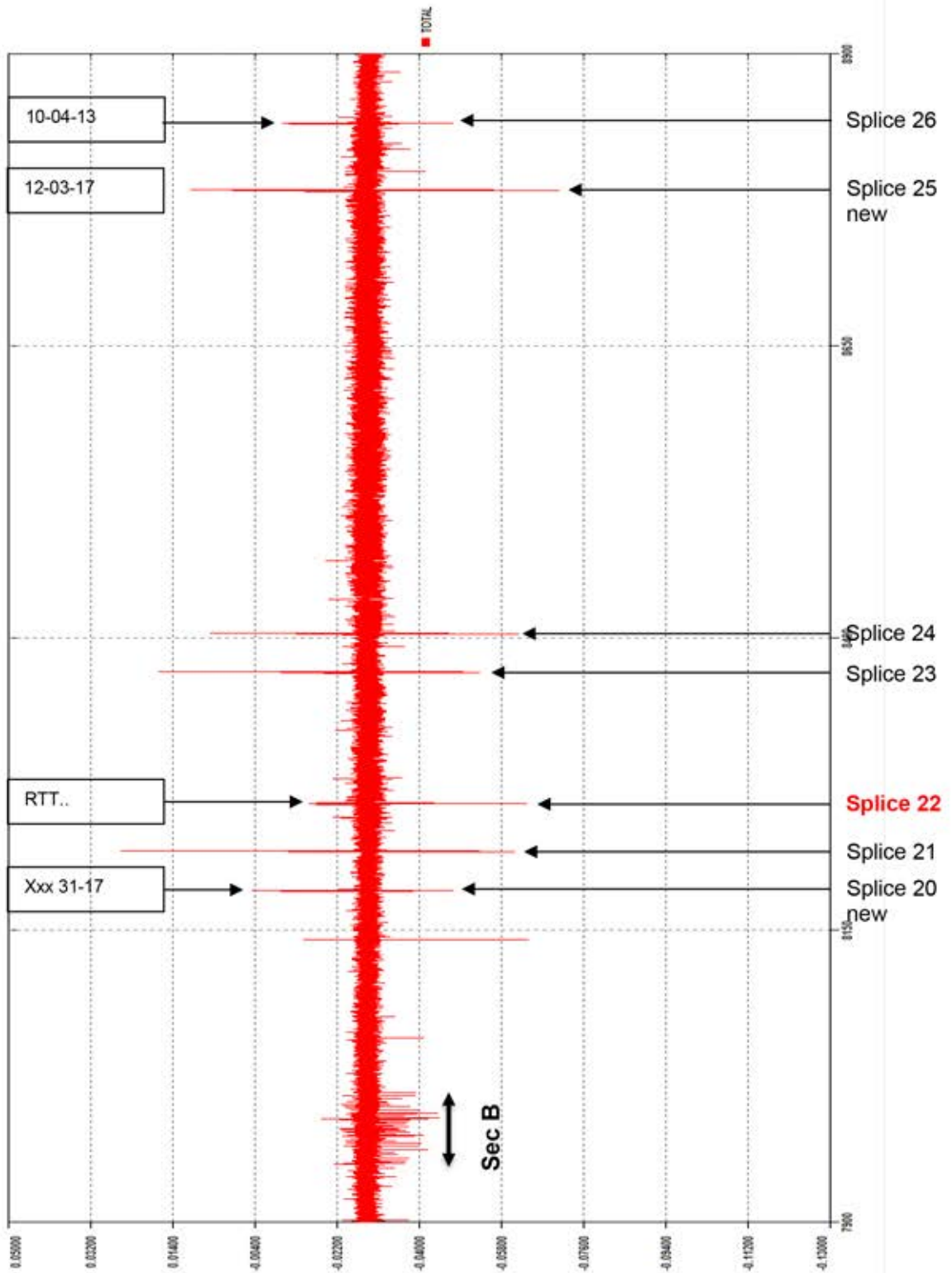
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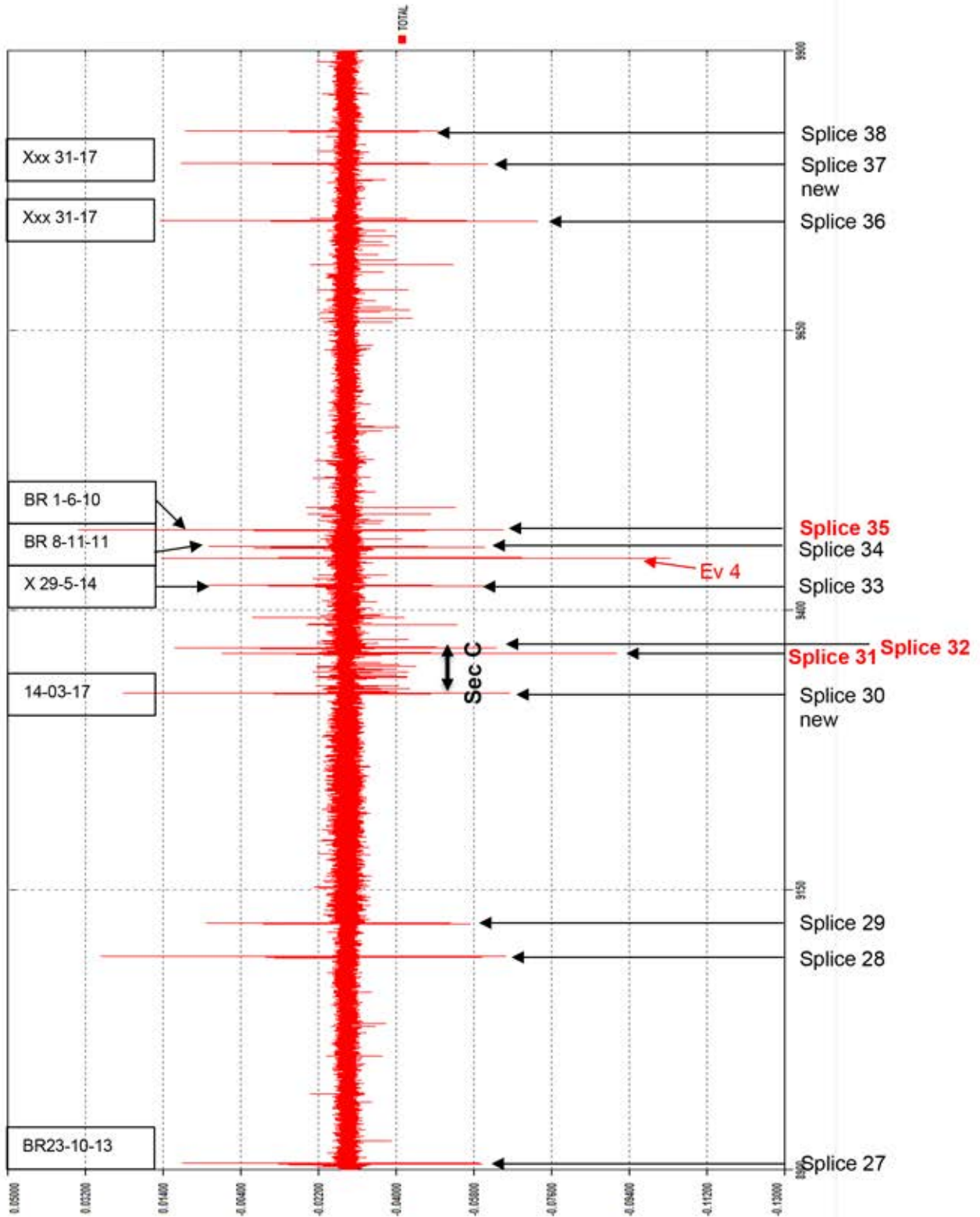




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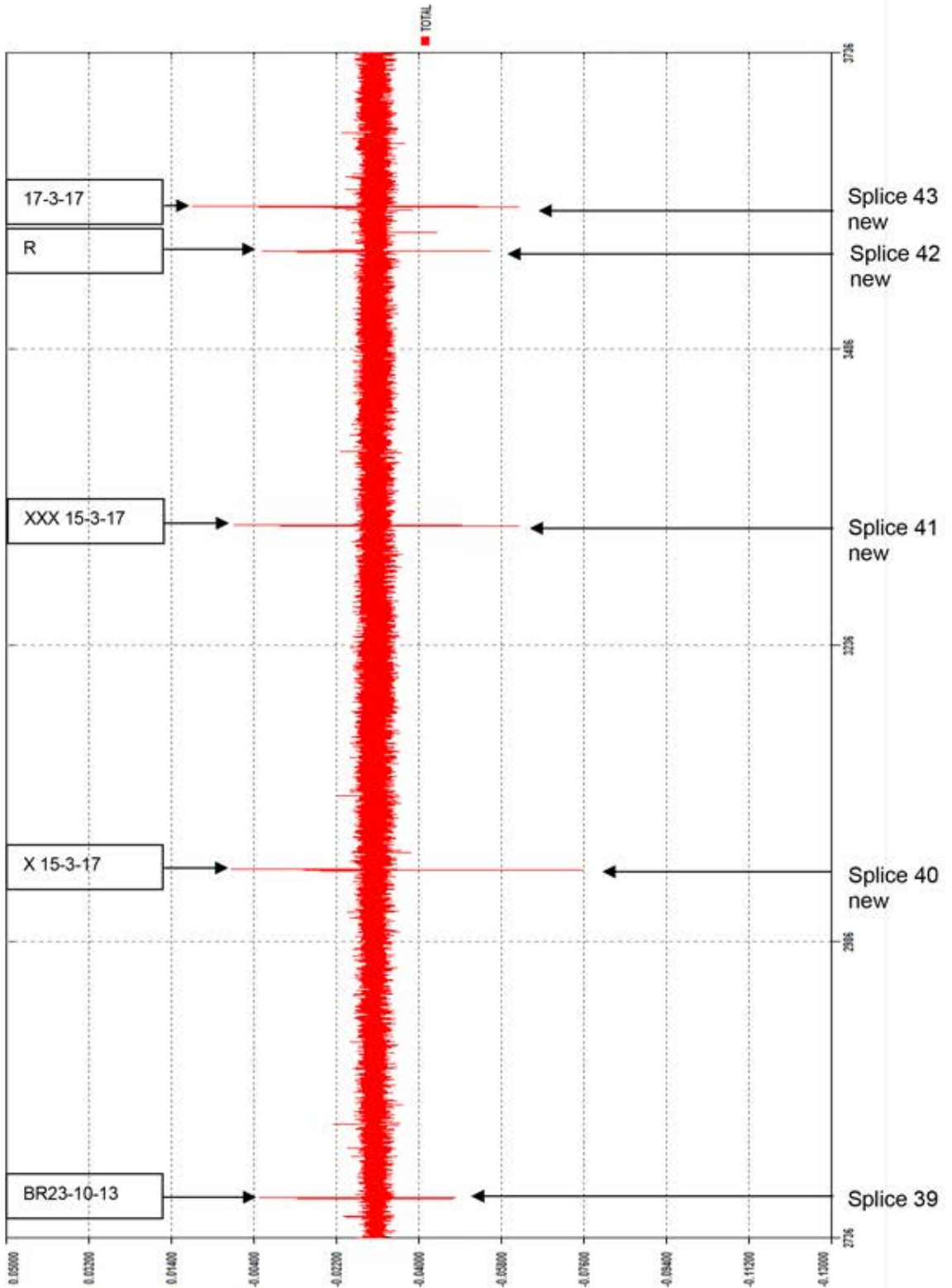
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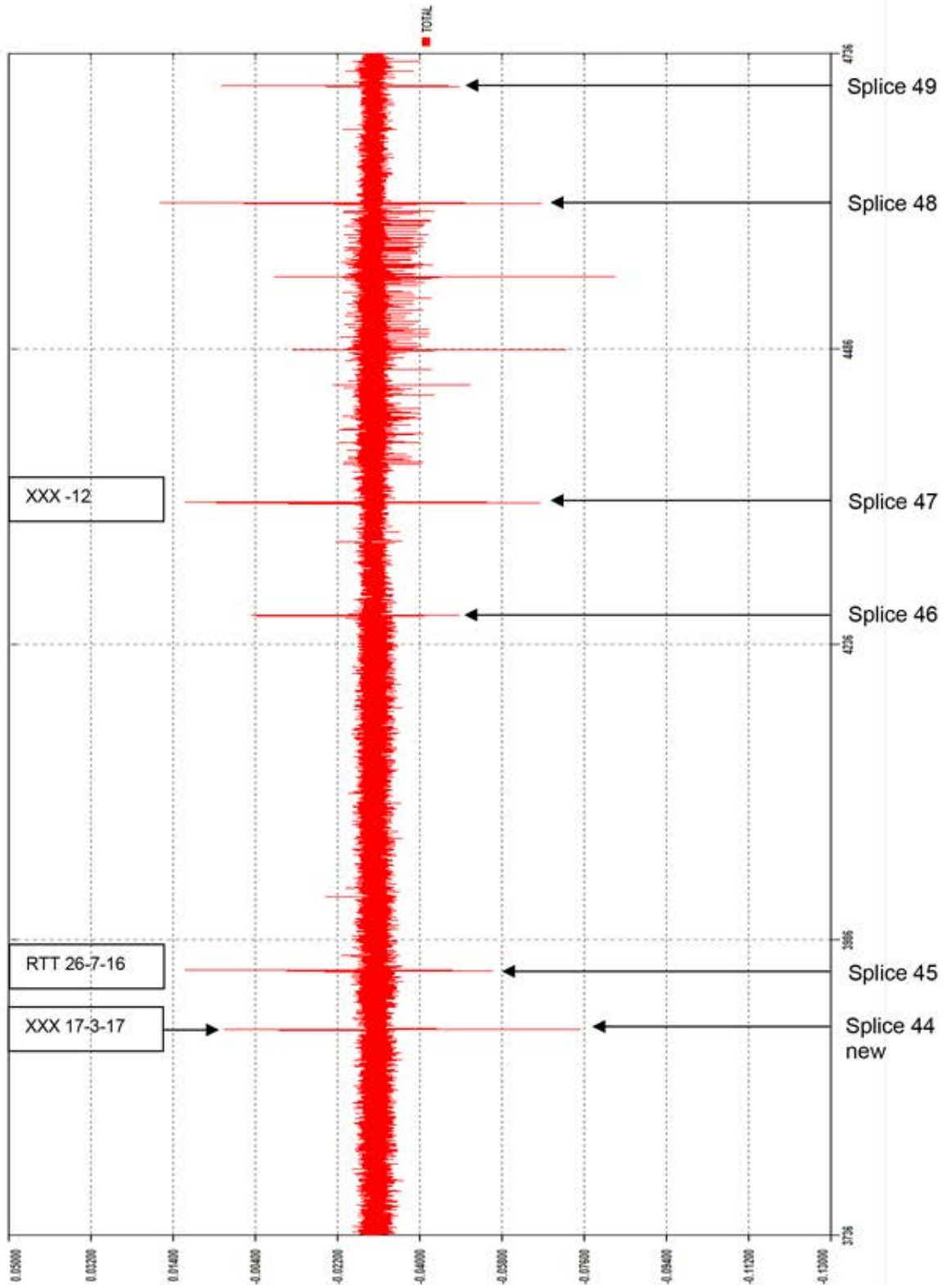
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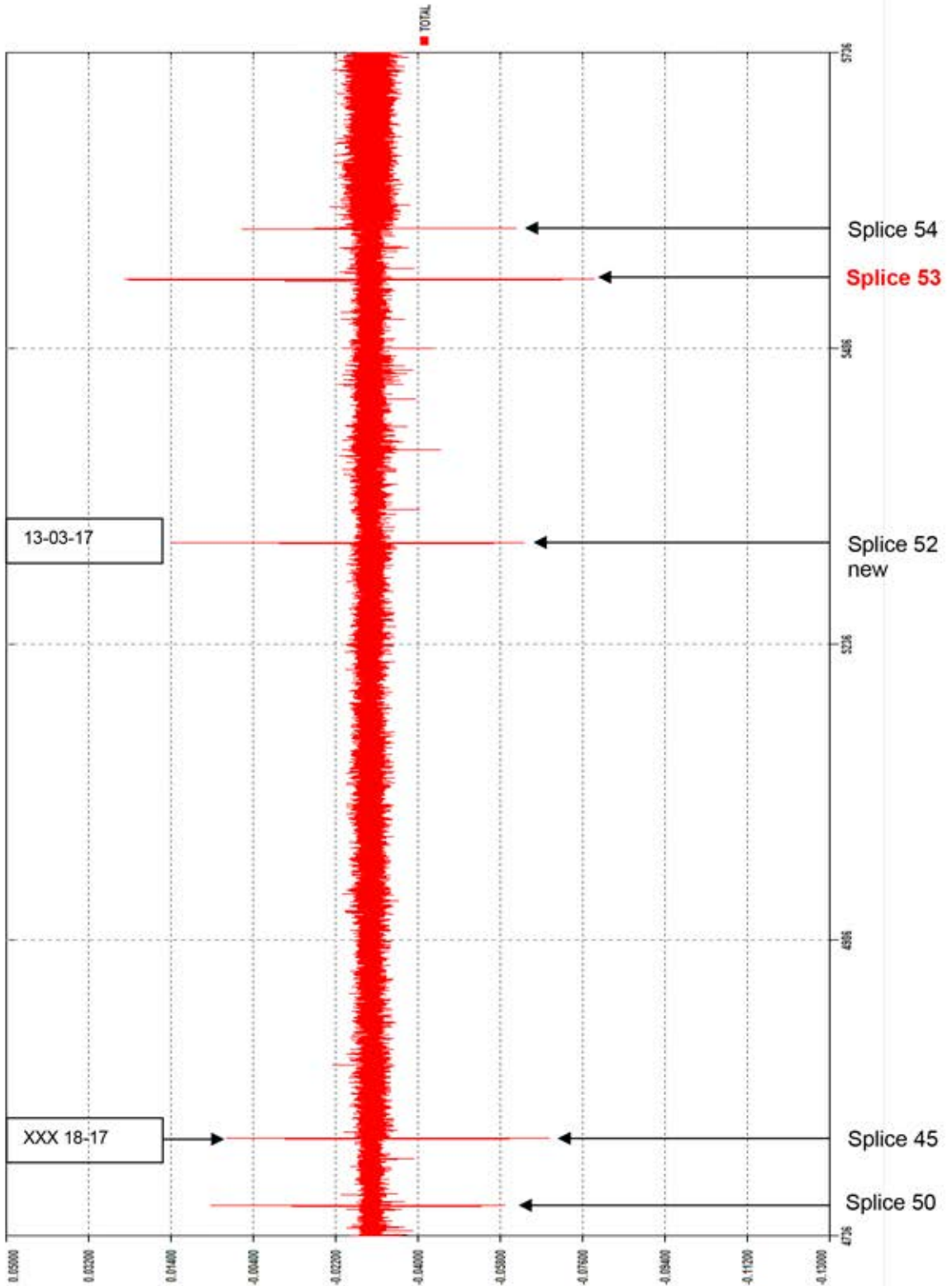
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