Federal Railroad Administration
Office of Safety
Headquarters Assigned
Accident Investigation Report
HQ-2008-44

San Luis & Rio Grande Railroad (SLRG)
Leveta, CO
April 19, 2008

Note that 49 U.S.C. §20903 provides that no part of an accident or incident report made by the Secretary of Transportation/Federal Railroad Administration under 49 U.S.C. §20902 may be used in a civil action for damages resulting from a matter mentioned in the report.

DEPARTMENT OF TRANSPORTATION
FEDERAL RAILROAD ADMINISTRATION

FRA FACTUAL RAILROAD ACCIDENT REPORT

FRA File # HQ-2008-44

1.Name of Railroad Operating Train #1: San Luis & Rio Grande RR [SLRG]	1a. Alphabetic Code: SLRG	1b. Railroad Accident/Incident No.: 342008
2.Name of Railroad Operating Train #2: N/A	2a. Alphabetic Code: N/A	2b. Railroad Accident/Incident No.: N/A
3.Name of Railroad Operating Train #3: N/A	3a. Alphabetic Code: N/A	3b. Railroad Accident/Incident No.: N/A
4.Name of Railroad Responsible for Track Maintenance: San Luis & Rio Grande RR [SLRG]	4a. Alphabetic Code: SLRG	4b. Railroad Accident/Incident No.: 342008
5. U.S. DOT_AAR Grade Crossing Identification Number:	6. Date of Accident/Incident: Month 04 | Day 19 | Year 2008	7. Time of Accident/Incident: 11:00: ☐ AM ☑ PM

8. Type of Accident/Indicent *(single entry in code box)*: 1. Derailment; 2. Head on collision; 3. Rear end collision; 4. Side collision; 5. Raking collision; 6. Broken Train collision; 7. Hwy-rail crossing; 8. RR grade crossing; 9. Obstruction; 10. Explosion-detonation; 11. Fire/violent rupture; 12. Other impacts; 13. Other *(describe in narrative)* — Code: 01

9. Cars Carrying HAZMAT	10. HAZMAT Cars Damaged/Derailed	11. Cars Releasing HAZMAT	12. People Evacuated	13. Division
0	N/A	N/A	0	System

14. Nearest City/Town	15. Milepost *(to nearest tenth)*	16. State Abbr	16. State Code	17. County
La Veta	199.9	N/A	CO	HUERFANO

18. Temperature (F) *(specify if minus)*	19. Visibility *(single entry)* 1. Dawn 2. Day 3.Dusk 4.Dark — Code	20. Weather (single entry) 1. Clear 2. Cloudy 3. Rain 4. Fog 5.Sleet 6.Snow — Code	21. Type of Track 1. Main 2. Yard 3. Siding 4. Industry — Code
34 F	4	1	1

22. Track Name/Number	23. FRA Track Class (1-9, X) — Code	24. Annual Track Density *(gross tons in millions)*	25. Time Table Direction 1. North 2. South 3. East 4. West — Code
Single Main Track	1	1.5	3

OPERATING TRAIN #1

26. Type of Equipment Consist *(single entry)* 1. Freight train 2. Passenger train 3. Commuter train 4. Work train 5. Single car 6. Cut of cars 7. Yard/switching 8. Light loco(s). 9. Maint./inspect.car — A. Spec. MoW Equip. Code	27. Was Equipment Attended? 1. Yes 2. No — Code	28. Train Number/Symbol
1	1	No. 68

29. Speed *(recorded speed, if available)* R - Recorded E - Estimated: 4 MPH — Code: E

30. Trailing Tons *(gross tonnage, excluding power units)*: 2340

31. Method(s) of Operation *(enter code(s) that apply)*: a. ATCS; b. Auto train control; c. Auto train stop; d. Cab; e. Traffic; f. Interlocking; g. Automatic block; h. Current of traffic; i. Time table/train orders; j.Track warrant control; k. Direct traffic control; l.Yard limits; m.Special instructions; n. Other than main track; o. Positive train control; p. Other *(Specify in narrative)*

Code(s): j | N/A | N/A | N/A | N/A

31a. Remotely Controlled Locomotive? 0 = Not a remotely controlled; 1 = Remote control portable; 2 = Remote control tower; 3 = Remote control transmitter - more than one remote control transmitter: 0

32. Principal Car/Unit	a. Initial and Number	b. Position in Train	c. Loaded *(yes/no)*
(1) First involved *(derailed, struck, etc)*	CYXX592818	18	yes
(2) Causing *(if mechanical cause reported)*	0	0	N/A

33. If railroad employee(s) tested for drug/alcohol use, enter the number that were positive in the appropriate box.

Alcohol	Drugs
0	0

34. Was this consist transporting passengers? (Y/N): N

35. Locomotive Units	a. Head End	Mid Train b. Manual	Mid Train c. Remote	Rear End d. Manual	Rear End c. Remote
(1) Total in Train	2	0	0	0	0
(2) Total Derailed	0	0	0	0	0

36. Cars	Loaded a. Freight	Loaded b. Pass.	Empty c. Freight	Empty d. Pass.	e. Caboose
(1) Total in Equipment Consist	18	0	0	0	0
(2) Total Derailed	6	0	0	0	0

37. Equipment Damage — This Consist: $120,000.00

38. Track, Signal, Way, & Structure Damage: $450,000.00

39. Primary Cause Code: T001

40. Contributing Cause Code: T110

Number of Crew Members

41. Engineer/ Operators	42. Firemen	43. Conductors	44. Brakemen
1	0	2	0

Length of Time on Duty

45. Engineer/Operator	46. Conductor
Hrs 5 Mi 0	Hrs 5 Mi 0

Casualties to:	47. Railroad Employees	48. Train Passengers	49. Other
Fatal	0	0	0
Nonfatal	0	0	0

50. EOT Device? 1. Yes 2. No — 1

51. Was EOT Device Properly Armed? 1. Yes 2. No — 1

52. Caboose Occupied by Crew? 1. Yes 2. No — N/A

OPERATING TRAIN #2

53. Type of Equipment Consist *(single entry)* 1. Freight train 2. Passenger train 3. Commuter train 4. Work train 5. Single car 6. Cut of cars 7. Yard/switching 8. Light loco(s). 9. Maint./inspect.car — A. Spec. MoW Equip. Code	54. Was Equipment Attended? 1. Yes 2. No — Code	55. Train Number/Symbol
N/A	N/A	N/A

56. Speed *(recorded speed, if available)* R - Recorded E - Estimated: 0 MPH — Code: N/A

58. Method(s) of Operation *(enter code(s) that apply)*: a. ATCS; b. Auto train control; g. Automatic block; h. Current of traffic; m.Special instructions; n. Other than main track

58a. Remotely Controlled Locomotive? 0 = Not a remotely controlled; 1 = Remote control portable

DEPARTMENT OF TRANSPORTATION
FEDERAL RAILROAD ADMINISTRATION

FRA FACTUAL RAILROAD ACCIDENT REPORT

FRA File # HQ-2008-44

57. Trailing Tons *(gross tonnage, excluding power units)* N/A

c. Auto train stop; d. Cab; e. Traffic; f. Interlocking; i. Time table/train orders; j.Track warrant control; k. Direct traffic control; l.Yard limits; o. Positive train control; p. Other *(Specify in narrative)* Code(s): N/A N/A N/A N/A N/A

2 = Remote control tower
3 = Remote control transmitter - more than one remote control transmitter: N/A

59. Principal Car/Unit	a. Initial and Number	b. Position in Train	c. Loaded *(yes/no)*
(1) First involved *(derailed, struck, etc)*	0	0	N/A
(2) Causing *(if mechanical cause reported)*	0	0	N/A

60. If railroad employee(s) tested for drug/alcohol use, enter the number that were positive in the appropriate box.

Alcohol	Drugs
N/A	N/A

61. Was this consist transporting passengers? (Y/N) N/A

62. Locomotive Units	a. Head End	Mid Train b. Manual	Mid Train c. Remote	Rear End d. Manual	Rear End c. Remote
(1) Total in Train	0	0	0	0	0
(2) Total Derailed	0	0	0	0	0

63. Cars	Loaded a. Freight	Loaded b. Pass.	Empty c. Freight	Empty d. Pass.	e. Caboose
(1) Total in Equipment Consist	0	0	0	0	0
(2) Total Derailed	0	0	0	0	0

64. Equipment Damage This Consist: $0.00

65. Track, Signal, Way, & Structure Damage: $0.00

66. Primary Cause Code: N/A

67. Contributing Cause Code: N/A

Number of Crew Members

68. Engineer/ Operators	69. Firemen	70. Conductors	71. Brakemen
0	0	0	0

Length of Time on Duty

72. Engineer/Operator: Hrs 0 Mi 0

73. Conductor: Hrs 0 Mi 0

Casualties to:	74. Railroad Employees	75. Train Passengers	76. Other
Fatal	0	0	0
Nonfatal	0	0	0

77. EOT Device? 1. Yes 2. No N/A

78. Was EOT Device Properly Armed? 1. Yes 2. No N/A

79. Caboose Occupied by Crew? 1. Yes 2. No N/A

OPERATING TRAIN #3

80. Type of Equipment Consist *(single entry)*: 1. Freight train; 2. Passenger train; 3. Commuter train; 4. Work train; 5. Single car; 6. Cut of cars; 7. Yard/switching; 8. Light loco(s); 9. Maint./inspect.car; A. Spec. MoW Equip. Code: N/A

81. Was Equipment Attended? 1. Yes 2. No Code: N/A

82. Train Number/Symbol: N/A

83. Speed *(recorded speed, if available)* Code: R - Recorded; E - Estimated N/A MPH N/A

84. Trailing Tons *(gross tonnage, excluding power units)* N/A

85. Method(s) of Operation *(enter code(s) that apply)*: a. ATCS; b. Auto train control; c. Auto train stop; d. Cab; e. Traffic; f. Interlocking; g. Automatic block; h. Current of traffic; i. Time table/train orders; j.Track warrant control; k. Direct traffic control; l.Yard limits; m.Special instructions; n. Other than main track; o. Positive train control; p. Other *(Specify in narrative)* Code(s): N/A N/A N/A N/A N/A

85a. Remotely Controlled Locomotive?
0 = Not a remotely controlled
1 = Remote control portable
2 = Remote control tower
3 = Remote control transmitter - more than one remote control transmitter: N/A

86. Principal Car/Unit	a. Initial and Number	b. Position in Train	c. Loaded *(yes/no)*
(1) First involved *(derailed, struck, etc)*	N/A	N/A	N/A
(2) Causing *(if mechanical cause reported)*	N/A	N/A	N/A

87. If railroad employee(s) tested for drug/alcohol use, enter the number that were positive in the appropriate box.

Alcohol	Drugs
N/A	N/A

88. Was this consist transporting passengers? (Y/N) N/A

89. Locomotive Units	a. Head End	Mid Train b. Manual	Mid Train c. Remote	Rear End d. Manual	Rear End c. Remote
(1) Total in Train	N/A	N/A	N/A	N/A	N/A
(2) Total Derailed	N/A	N/A	N/A	N/A	N/A

90. Cars	Loaded a. Freight	Loaded b. Pass.	Empty c. Freight	Empty d. Pass.	e. Caboose
(1) Total in Equipment Consist	N/A	N/A	N/A	N/A	N/A
(2) Total Derailed	N/A	N/A	N/A	N/A	N/A

91. Equipment Damage This Consist: N/A

92. Track, Signal, Way, & Structure Damage: N/A

93. Primary Cause Code: N/A

94. Contributing Cause Code: N/A

Number of Crew Members

95. Engineer/ Operators	96. Firemen	97. Conductors	98. Brakemen
N/A	N/A	N/A	N/A

Length of Time on Duty

99. Engineer/Operator: Hrs N/A Mi N/A

100. Conductor: Hrs N/A Mi N/A

Casualties to:	101. Railroad Employees	102. Train	103. Other
Fatal	N/A	N/A	N/A
Nonfatal	N/A	N/A	N/A

104. EOT 1. Yes 2. No N/A

105. Was EOT Device Properly 1. Yes 2. No N/A

106. Caboose Occupied by Crew? 1. Yes 2. No N/A

Highway User Involved

107. Code: A. Auto; B. Truck; C. Truck-Trailer.; D. Pick-Up Truck; E. Van; F. Bus; G. School Bus; H. Motorcycle; J. Other Motor Vehicle; K. Pedestrian; M. Other *(spec. in narrative)*: N/A

108. Vehicle Speed *(est. MPH at impact)*: N/A

109. *geographical)* Code: 1.North 2.South 3.East 4.West: N/A

Rail Equipment Involved

111. Equipment Code: 1.Train *(units pulling)*; 2.Train *(units pushing)*; 3.Train *(standing)*; 4.Car(s) *(moving)*; 5.Car(s) *(standing)*; 6.Light Loco(s) *(moving)*; 7.Light(s) *(standing)*; 8.Other *(specify in narrative)*: N/A

112. Position of Car Unit in: N/A

DEPARTMENT OF TRANSPORTATION
FEDERAL RAILROAD ADMINISTRATION

FRA FACTUAL RAILROAD ACCIDENT REPORT

FRA File # HQ-2008-44

110. Position 1.Stalled on Crossing 2.Stopped on Crossing 3.Moving Over Crossing 4. Trapped	Code N/A	113. Circumstance 1. Rail Equipment Struck Highway User 2. Rail Equipment Struck by Highway User	Code N/A
114a. Was the highway user and/or rail equipment involved in the impact transporting hazardous materials? 1. Highway User 2. Rail Equipment 3. Both 4. Neither	Code N/A	114b. Was there a hazardous materials release 1. Highway User 2. Rail Equipment 3. Both 4. Neither	Code N/A
114c. State here the name and quantity of the hazardous materials released, if any. N/A			

115. Type Crossing Warning 1.Gates 2.Cantilever FLS 3.Standard FLS 4.Wig Wags 5.Hwy. traffic signals 6.Audible 7.Crossbucks 8.Stop signs 9.Watchman 10.Flagged by crew 11.Other *(spec. in narr.)* 12.None	116. Signaled Crossing *(See instructions for codes)*	Code	117. Whistle Ban 1. Yes 2. No 3. Unknown	Code
Code(s) N/A N/A N/A N/A N/A N/A N/A		N/A		N/A

118. Location of Warning 1. Both Sides 2. Side of Vehicle Approach 3. Opposite Side of Vehicle Approach	Code N/A	119. Crossing Warning with Highway Signals 1. Yes 2. No 3. Unknown	Code N/A	120. Crossing Illuminated by Street Lights or Special Lights 1. Yes 2. No 3. Unknown	Code N/A

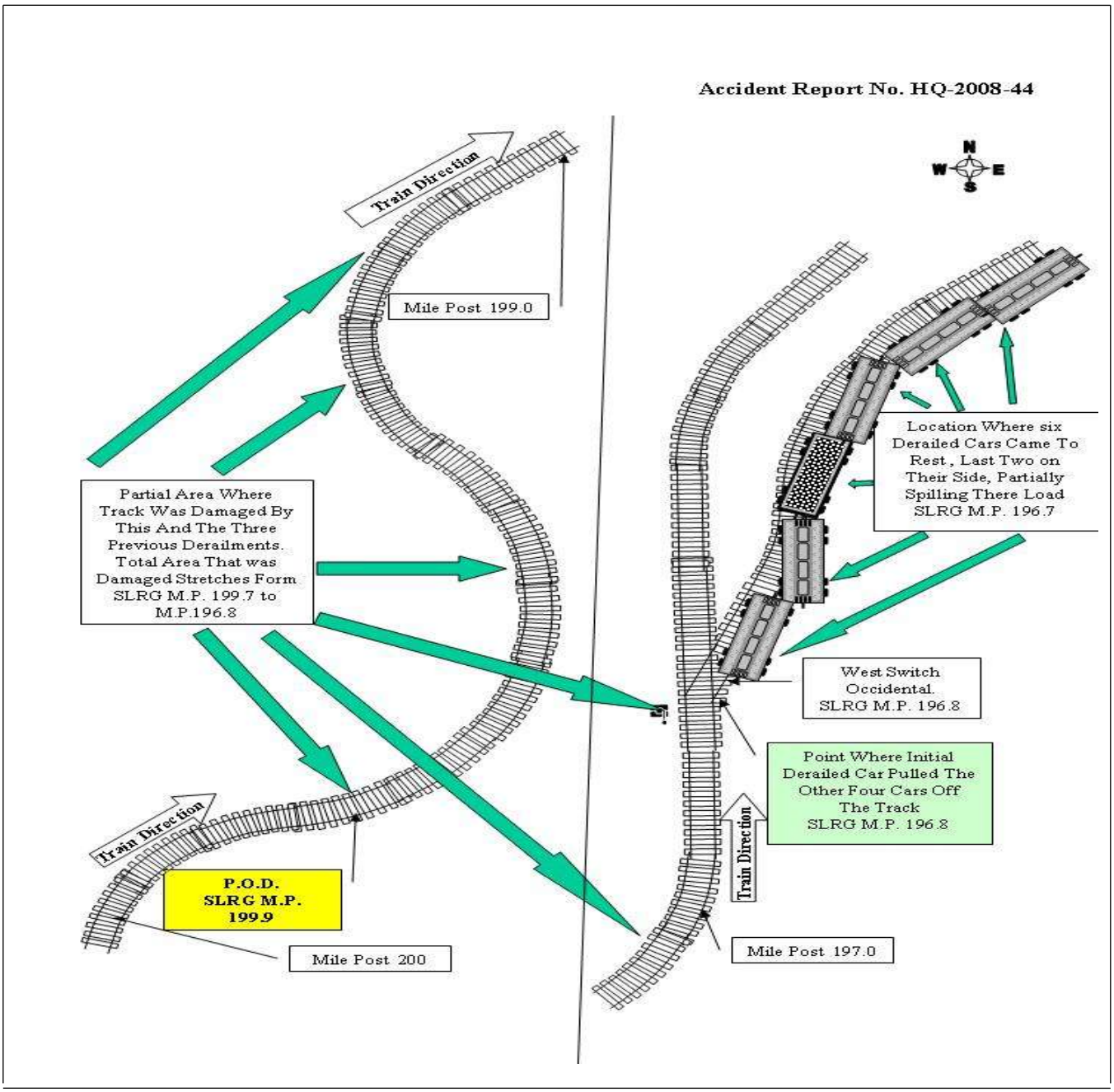
121. Age N/A	122. Driver's Gender 1. Male 2. Female	Code N/A	123. Driver Drove Behind or in Front of and Struck or was Struck by Second Train 1. Yes 2. No 3. Unknown	Code N/A	124. Driver 1. Drove around or thru the Gate 2. Stopped and then Proceeded 3. Did not Stop 4. Stopped on Crossing 5. Other *(specify in narrative)*	Code N/A

125. Driver Passed Highway Vehicle 1. Yes 2. No 3. Unknown	Code N/A	126. View of Track Obscured by *(primary obstruction)* 1. Permanent Structure 2. Standing Railroad Equipment 3. Passing Train 4. Topography 5. Vegetation 6. Highway Vehicle 7. Other *(specify in narrative)* 8. Not obstructed	Code N/A

Casualties to:	Killed	Injured	127. Driver 1. Killed 2.Injured 3. Uninjured	Code N/A	128. Was Driver in the Vehicle? 1. Yes 2. No	Code N/A
129. Highway-Rail Crossing Users	N/A	N/A	130. Highway Vehicle Property Damage *(est. dollar damage)*	N/A	131. Total Number of Highway-Rail Crossing Users *(include driver)*	N/A

132. Locomotive Auxiliary Lights? 1. Yes 2. No	Code N/A	133. Locomotive Auxiliary Lights Operational? 1. Yes 2. No	Code N/A
134. Locomotive Headlight Illuminated? 1. Yes 2. No	Code N/A	135. Locomotive Audible Warning Sounded? 1. Yes 2. No	Code N/A

136. DRAW A SKETCH OF ACCIDENT AREA INCLUDING ALL TRACKS, SIGNALS, SWITCHES, STRUCTURES, OBJECTS, ETC., INVOLVED.



137. SYNOPSIS OF THE ACCIDENT

On April 19, 2008 at 11:00 p.m. MDT loaded San Luis Rio Grande Railroad (SLRG) Freight Train # 68 derailed the 16th head car behind the locomotives of the 18-car train while traveling eastward on the SLRG Alamosa Subdivision. The accident occurred about 9 miles west of La Veta, Colorado in Huerfano County on the SLRG single Main Track at milepost (MP) 199.9.

The crew of SLRG Train # 68 was unaware of the derailed car and continued east for an additional 3 miles. Just after traveling over the west switch of Occidental Station at MP196.8 the train experienced an undesired emergency application of the train air brakes and came to a stop. Upon inspection it was discovered that the 13th through 18th head cars behind the locomotives were derailed. Upon further inspection, it was learned that the 16th head car derailed the rear trucks at MP 199.9. The derailed car was dragged to the west switch of Occidental where it pulled the other five cars off the track. The derailed cars encroached on and damaged the SLRG single main track as well as the Occidental Siding.

There were no injuries reported by the 3-person crew. No hazardous materials were involved and no evacuations were required. Damage estimates were $ 120,000 to the train consist and $450,000 to the track.

The SLRG train was being operated under Track Warrant Control (TWC) at an estimated speed of 4 mph at the time of the initial derailment and an estimated speed of 10 mph at the time of the undesired emergency brake application. The maximum operating speed for a loaded freight train on the single Main Track in this area is 12 mph as designated by the current SLRG Timetable # 3. A daily bulletin further restricted the speed at the initial point of derailment to 5 mph.

At the time of the derailment it was night, dark, clear, and the temperature was 34 °F.

The cause of the accident was due to a soft roadbed caused by dirt installed to stabilize the track during a previous derailment. The FRA primary cause code is T001 “Roadbed settled or soft.” Additionally, the crossties at the Point of Derailment (POD) were either damaged or destroyed from previous derailments allowing wide gage to manifest. Although the wide gage measurements were not beyond the FRA Track Safety Standards (TSS), combined with the geometry conditions, it was a contributing factor. The FRA contributing cause code is T110 “Wide gage (due to defective or missing crossties).”

138. NARRATIVE

CIRCUMSTANCES PRIOR TO THE ACCIDENT

The crew of SLRG Train 68 consisted of a locomotive engineer, a conductor, and a student conductor. The crew went on duty at 6:00 p.m. MDT in Alamosa, Colorado on April 19, 2008. This is their home terminal and each crewmember received the required statutory off-duty rest period of 10 hours, at Alamosa, prior to reporting for duty.

The scheduled route of the loaded freight train was from Alamosa east to Walsenburg, Colorado. They were assigned to drop off the loaded cars and pick up empty ones at Walsenburg and then return to Alamosa. The train consist upon leaving Alamosa was equipped with 2 locomotives on the head-end and 18 loaded freight cars. A Class 1 air brake test was performed and the End-Of-Train Device (EOTD) tested on April 19 prior to departure. These tests were conducted successfully by SLRG mechanical personnel.

All three crewmembers were present in the control compartment of the lead locomotive when the derailment occurred. The engineer was positioned on the south side of the locomotive at the controls, the conductor was positioned in the conductor's seat on the north side of the locomotive, and the student conductor was also on the north side positioned in a seat directly ahead of the conductor. Interviews performed by FRA revealed that the trip was uneventful prior to the derailment.

This portion of the Alamosa Subdivision is in the mountains and traverses La Veta Pass. The single Main Track has numerous curves. The track is situated alongside the mountain with the face of the mountain directly to the south of the tracks and a steep downward slope directly to the north. The initial POD was at SLRG MP 199.9 which is in the first portion of a compound curve. Descending into the curve from the east

there is a 9-degree left-hand curve that straightens out to a 0-degree, 47-minute left-hand curve; then tightens again into a 14-degree 0-minute left-hand curve. This curve stretches for about 2,000 feet and is part of a string of back-to-back reverse curves that descend all the way to La Veta. The track has a 2.5 to 3-percent descending grade at the POD for eastbound trains.

Track conditions in the area of the derailment were very poor. The single Main Track consists of jointed 110-lb and 115-lb rail. Evidence on the head of the rail indicates that it has been transposed. Due to recent derailments in the area the tie conditions were in very bad condition. The SLRG was in the process of replacing ties destroyed by earlier derailments when the most recent accident occurred. The roadbed was also in very poor condition because of the previous derailments. The ground is very soft allowing the track to pump up and down causing poor geometry conditions. Due to the poor tie condition at the POD joints were not supported which added to the poor geometry and gage conditions. The area of the derailment is in a remote part of southern Colorado about 9 miles uphill and west of La Veta.

The railroad timetable direction of the SLRG train was east. The geographic direction was also east to northeast. Timetable directions are used throughout this report.

THE ACCIDENT

SLRG Train 68 was traveling eastward on the SLRG single Main Track at an estimated speed of 4 mph through a temporary 5 mph speed restriction prior to the derailment. Although the controlling Locomotive # SLRG 8542 was equipped with an event recorder the speed indicator was malfunctioning which resulted in erratic speed readings. The maximum operating speed without the temporary speed restriction for a loaded freight train on the single Main Track is 12 mph as designated by the current SLRG Timetable No. 3.

The head-end of the train had just passed the west switch of Occidental Station. The engineer, conductor, and student conductor stated that they did not see or feel anything out of the ordinary while proceeding east toward Occidental. As the rear of the train was traveling over the switch the train crew immediately felt the train stop and noticed they had experienced an undesired emergency train air brake application.

After coming to a stop the engineer contacted the dispatcher to report the situation. The conductor and the student conductor walked the train to inspect it. It was discovered that the 13th through the 18th head cars behind the locomotives were derailed; these car counts do not include the locomotives. The 13th, 14th, and 15th head cars were derailed but upright. The 16th, 17th, and 18th head cars were laying on their sides with their contents (grain) dumped onto the tracks. The derailed cars fouled the single main as well as the siding tracks. The crew noticed evidence of gouged and broken ties west of the switch indicating a car was on the ground prior to the pile up at Occidental. The conductor and student conductor began walking back up the pass to try and find the POD. They walked back about 2.5 miles just west of a tunnel when they decided to head back. They had not yet found the POD but due to the time of day (night) and the possibility of bears in the area, they decided to return to the train. Railroad officials were contacted and it was decided that no emergency responders would be called until the morning. The general manager (GM) instructed the crew to take the train to La Veta and wait for his arrival there. He arrived at La Veta with a drug and alcohol collector. They performed initial drug and alcohol tests on the crew. After this was accomplished, the GM instructed the locomotive engineer and the student conductor to take the train to Walsenburg and tie it down. He then instructed the conductor to accompany him to try and locate the POD. They drove to Occidental and began walking west. After walking a little over 3 miles they discovered the POD.

Initial investigation by railroad officials determined the POD to be at SLRG MP 199.9. Evidence at the scene indicated that the rear trucks of Car # CYXX 592818, 16th head car, derailed in the first portion of a compound curve. The train proceeded for another 3 miles to the west switch of Occidental. At this location the derailed trucks of the 16th head car were diverted onto the siding tracks. The 16th head car then pulled the three cars ahead and two cars behind, derailing them and causing the undesired train air brake application. About 3 miles of the SLRG single Main Track was destroyed.

Maintenance personnel were on the scene the next morning, April 20, 2008 to assess the damages and begin cleanup and track reconstruction. Hulcher, an emergency wreck-clearing contractor based out of Cheyenne, Wyoming was also called and began arriving later that afternoon. They began to pick up the wrecked cars and clear the tracks for reconstruction. The SLRG Officials took the single Main Track as well as the Occidental Siding out-of-service. After analyzing the amount of track damages they realized that a little over

3 miles of ties were destroyed or badly damaged. The west switch at Occidental was also destroyed. They began changing out the destroyed ties and after 9 days of work they ran the first train over the derailment area. The track remained out-of-service and all trains were to notify the road-master before traveling over the derailment area. The road-master would then assign a qualified maintenance employee to visually walk the train through the derailment site. This practice continued for about 3 weeks until the track work was finished and the track was put into full service.

There were no hazardous materials involved. Damage estimates were $ 120,000 to the train consist and $ 450,000 to track.

ANALYSIS AND CONCLUSIONS:

ANALYSIS - TOXICOLOGICAL TESTING:

The crewmembers of SLRG Train 68 were tested under FRA reasonable cause even though FRA accident/incident testing criteria was not met.

CONCLUSION - TOXICOLOGICAL TESTING:

Results of the tests came back negative. Intoxication was not a factor.

ANALYSIS - LOCOMOTIVE ENGINEER OPERATING PERFORMANCE:

The locomotive was equipped with a speed indicator and an event recorder. The relevant event recorded data was downloaded by the trainmaster at the accident site and analyzed by the SLRG locomotive facility personnel at Alamosa.

CONCLUSION - LOCOMOTIVE ENGINEER OPERATING PERFORMANCE:

Although the controlling locomotive was equipped with an event recorder no information was given to the FRA as the railroad had lost the computer read out. According to interviews the speed indicator was malfunctioning resulting in erratic speed readings. Due to this malfunction speed cannot be ruled out as a contributing factor.

ANALYSIS:

FRA obtained fatigue related information for the 10-day period preceding this incident including the 10-day work history (on duty/off duty cycles) for all of the employees involved.
CONCLUSION:

Upon analysis of that data FRA concluded fatigue was not probable for any of the employees involved.

ANALYSIS - TRACK INSPECTION:

This portion of track is second-hand jointed rail that had been transposed. At the POD the north rail consists of 115-lb jointed rail that was manufactured by Colorado Fuel and Iron (C F & I) in 1947 and the south rail consists of 110-lb jointed rail that was also manufactured by C F & I in 1928. The jointed rail was held together with 24-inch joint bars that had wear indications on the top caused by the flange of the train wheels running on them. The joint bars hold the rail together with four bolts in each joint. There is no evidence of loose joints or elongated bolt holes at the POD. The rail is spiked to the ties using two inside rail spikes, one outside rail spike, and one outside hold down spike. The rail is also anchored to the tie using Channeloc and Wooding style anchors utilizing the box anchor pattern on every third tie. There is no evidence of lateral rail movement.
The single Main Track in this area had experienced three derailments in the past 3.5 months. The ties in this area are very poor due to number of ties destroyed by previous derailments. The roadbed was also in very poor condition. After the first derailment that occurred in December of 2007, the ground froze prior to the railroad completing ballast dumping and track surfacing. At the direction of the GM the maintenance crew dumped dirt in the roadbed to hold the track in place since ballast was not immediately available. The GM had intentions to replace the dirt with suitable ballast when it became available. Unfortunately days after the

dirt was placed into the roadbed, cold weather froze the track to the dirt. Due to the very cold and snowy winter, the ground remained frozen. Just prior to the most recent derailment, warm weather thawed the dirt that was holding the track in place. The roadbed became very soft, allowing the track to pump up and down, causing poor geometry conditions. Due to the poor tie condition at the POD the rail joints were not supported which added to the poor geometry and gage conditions. Above this unstable sub-grade is 1 3/4 inch granite rock. The rock completely fills the cribs between the ties and stretches out from the end of the ties in both directions for 2 feet. There is no evidence of the ties swinging above the sub-grade. The track at the POD is on the side of a mountain with the south rail facing the uphill side and the north rail facing the downhill side.

At the POD the gage of the track was 57.5 inches with little movement within the tie plate or lateral movement of the tie plate on the tie. The largest geometry reading was a 1.5-inch profile 8 feet 6 inches to the west of the POD. The largest warp condition was 1 inch in 15.5 feet at the POD. The alignment deviation of the curve measurement was 3.6 inches and the V-max showed the speed of the curve to be good for 24.04 mph.

All measurements were taken at the scene by the FRA Track Specialist during the initial accident investigation.

CONCLUSION - TRACK INSPECTION:
Results of a track inspection in the area where the first car derailed revealed that the track was in poor condition. Although all measurements taken by the FRA Track Specialist did not add up to an exception of the FRA Track Safety Standards the dirt installed to hold the roadbed during a previous derailment became soft with the spring thaw and was unable to support the track structure, allowing for poor geometry conditions. This along with widening gage due to ineffective crosstie support at the same location of the poor geometry condition could have caused the derailment.

ANALYSIS - MECHANICAL INSPECTION:

A close examination of derailed cars was performed at the scene by a SLRG Mechanical Manager. He found that the initial car that was derailed was hopper Car # CYXX592818.

CONCLUSION - MECHANICAL INSPECTION:

Results of the mechanical inspection found no mechanical problems that might have been a casual or contributing factor to the derailment.

ANALYSIS - WEATHER:

The weather on the day of the accident was clear and calm. The temperature was 45 °F. The weather during the weeks prior to the derailment was cold but temperatures rose dramatically the week of the derailment.

CONCLUSION - WEATHER:

The dramatic temperature change the week of the derailment caused the frozen ground to thaw and become very muddy and unstable. This unstable muddy soil condition allowed the track to pump up and down allowing poor geometry conditions to form.

OVERALL CONCLUSIONS:
The railroad was in compliance with its own rules and all applicable Federal Standards at the time of the derailment. Poor judgment during previous derailments at this location had contributed to the derailment of April 19, 2008. This included the installation of dirt in the track structure to hold the track in place after a derailment that occurred on December 3, 2007. This dirt froze in place and maintenance crews were unable to remove it before the spring thaw. In addition, operating trains over damaged and destroyed ties before they were replaced contributed to wide track gage problems. Also, due to the inaccuracy of the speed indicator on the controlling locomotive the crew could only estimate the speed of the train as 4 mph at the time of the initial derailment. Because of the inability of the SLRG to provide event recorder data the speed of the train at the point of derailment cannot be provided. Although the crew's estimated speed was 4 mph there is nothing that indicates they were not speeding.

PROBABLE CAUSE AND CONTRIBUTING FACTORS

The cause of the accident was due to a soft roadbed caused by dirt installed to stabilize the track during a previous derailment. The FRA primary cause code is T001 “Roadbed settled or soft.” Additionally, the crossties at the POD were either damaged or destroyed from previous derailments which allowed wide track gage conditions to exist. Although the wide gage measurements were not beyond the FRA TSS, and combined with the poor geometry conditions, it was a contributing factor. The FRA contributing cause code is T110 “Wide gage (due to defective or missing crossties