Federal Railroad Administration
Office of Safety
Headquarters Assigned
Accident Investigation Report
HQ-2006-64

Burlington Northern Santa Fe
McKenzie, ND
July 16, 2006

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-2006-64

1.Name of Railroad Operating Train #1: BNSF Rwy Co. [BNSF]	1a. Alphabetic Code: BNSF	1b. Railroad Accident/Incident No.: TC0706107
2.Name of Railroad Operating Train #2: N/A	2a. Alphabetic Code: N/A	2b. Railroad Accident/Incident: N/A
3.Name of Railroad Responsible for Track Maintenance: BNSF Rwy Co. [BNSF]	3a. Alphabetic Code: BNSF	3b. Railroad Accident/Incident No.: TC0706107
4. U.S. DOT_AAR Grade Crossing Identification Number:	5. Date of Accident/Incident: Month 07 / Day 16 / Year 2006	6. Time of Accident/Incident: 03:15: ☐ AM ☑ PM

7. 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): 01

8. Cars Carrying HAZMAT	9. HAZMAT Cars Damaged/Derailed	10. Cars Releasing HAZMAT	11. People Evacuated	12. Division
0	0	0	0	Twin Cities

13. Nearest City/Town	14. Milepost (to nearest tenth)	15. State Abbr	15. State Code	16. County
McKenzie	176.5	N/A	ND	BURLEIGH

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

21. Track Name/Number	22. FRA Track Class (1-9, X)	Code	23. Annual Track Density (gross tons in millions)	24. Time Table Direction 1. North 3. East	Code
N/A		N/A	N/A		N/A

OPERATING TRAIN #1

25. 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: 1

26. Was Equipment Attended? 1. Yes 2. No — Code: 1

27. Train Number/Symbol: GBREI NB916

28. Speed (recorded speed, if available) — Code
R - Recorded
E - Estimated 21 MPH — Code: R

29. Trailing Tons (gross tonnage, excluding power units): 15600

30. 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): g | j | N/A | N/A | N/A

30a. 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
2. South 4. West
Code: 0

31. Principal Car/Unit	a. Initial and Number	b. Position in Train	c. Loaded (yes/no)
(1) First involved (derailed, struck, etc)	N/A	24	yes
(2) Causing (if mechanical cause reported)	N/A	N/A	N/A

32. 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

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

34. 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	1
(2) Total Derailed	0	0	0	0	0

35. Cars	Loade a. Freight	Loade b. Pass.	Empty c. Freight	Empty d. Pass.	e. Caboose
(1) Total in Equipment Consist	110	0	0	0	0
(2) Total Derailed	20	0	0	0	0

36. Equipment Damage This Consist	37. Track, Signal, Way, & Structure Damage	38. Primary Cause Code	39. Contributing Cause Code
717401	275200	T109	N/A

Number of Crew Members

40. Engineer/ Operators	41. Firemen	42. Conductors	43. Brakemen
N/A	0	1	0

Length of Time on Duty

44. Engineer/Operator	45. Conductor
Hrs 6 Mi 55	Hrs 6 Mi 55

Casualties to:	46. Railroad Employees	47. Train Passengers	48. Other
Fatal	0	0	0
Nonfatal	N/A	0	0

49. EOT Device? 1. Yes 2. No — 1

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

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

OPERATING TRAIN #2

52. 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

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

54. Train Number/Symbol: N/A

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

57. 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

57a. Remotely Controlled Locomotive?
0 = Not a remotely controlled
1 = Remote control portable

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56. 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

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

59. 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

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

61. 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

62. Cars	Loade a. Freight	Loade 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

63. Equipment Damage This Consist: 0

64. Track, Signal, Way, & Structure Damage: 0

65. Primary Cause Code: N/A

66. Contributing Cause Code: N/A

Number of Crew Members

67. Engineer/ Operators	68. Firemen	69. Conductors	70. Brakemen
N/A	N/A	N/A	N/A

Length of Time on Duty

71. Engineer/Operator: Hrs 0 Mi 0

72. Conductor: Hrs 0 Mi 0

Casualties to:	73. Railroad Employees	74. Train Passengers	75. Other
Fatal	0	0	0
Nonfatal	0	0	0

76. EOT Device? 1. Yes 2. No: N/A

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

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

Highway User Involved

79. Type: 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)
Code: N/A

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

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

82. Position: 1.Stalled on Crossing 2.Stopped on Crossing 3.Moving Over Crossing 4. Trapped
Code: N/A

86a. 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

Rail Equipment Involved

83. Equipment: 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)
Code: N/A

84. Position of Car Unit in Train: N/A

85. Circumstance: 1. Rail Equipment Struck Highway User; 2. Rail Equipment Struck by Highway User
Code: N/A

86b. Was there a hazardous materials release by 1. Highway User 2. Rail Equipment 3. Both 4. Neither
Code: N/A

86c. State here the name and quantity of the hazardous materials released, if any.
N/A

87. Type of 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

Code(s)							
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

88. Signaled Crossing Warning (See instructions for codes)
Code: N/A

89. Whistle Ban 1. Yes 2. No 3. Unknown
Code: N/A

90. Location of Warning 1. Both Sides 2. Side of Vehicle Approach 3. Opposite Side of Vehicle Approach
Code: N/A

91. Crossing Warning Interconnected with Highway Signals 1. Yes 2. No 3. Unknown
Code: N/A

92. Crossing Illuminated by Street Lights or Special Lights 1. Yes 2. No 3. Unknown
Code: N/A

93. Driver's Age: 0

94. Driver's Gender 1. Male 2. Female
Code: N/A

95. Driver Drove Behind or in Front of Train and Struck or was Struck by Second Train 1. Yes 2. No 3. Unknown
Code: N/A

96. 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

97. Driver Passed Standing Highway Vehicle 1. Yes 2. No 3. Unknown
Code: N/A

98. 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

101. Casulties to Highway-Rail Crossing Users	Killed	Injured
	0	0

99. Driver Was 1. Killed 2.Injured 3. Uninjured
Code: N/A

100. Was Driver in the Vehicle? 1. Yes 2. No
Code: N/A

102. Highway Vehicle Property Damage (est. dollar damage): 0

103. Total Number of Highway-Rail Crossing Users (include driver): 0

104. Locomotive Auxiliary Lights? 1. Yes 2. No
Code: N/A

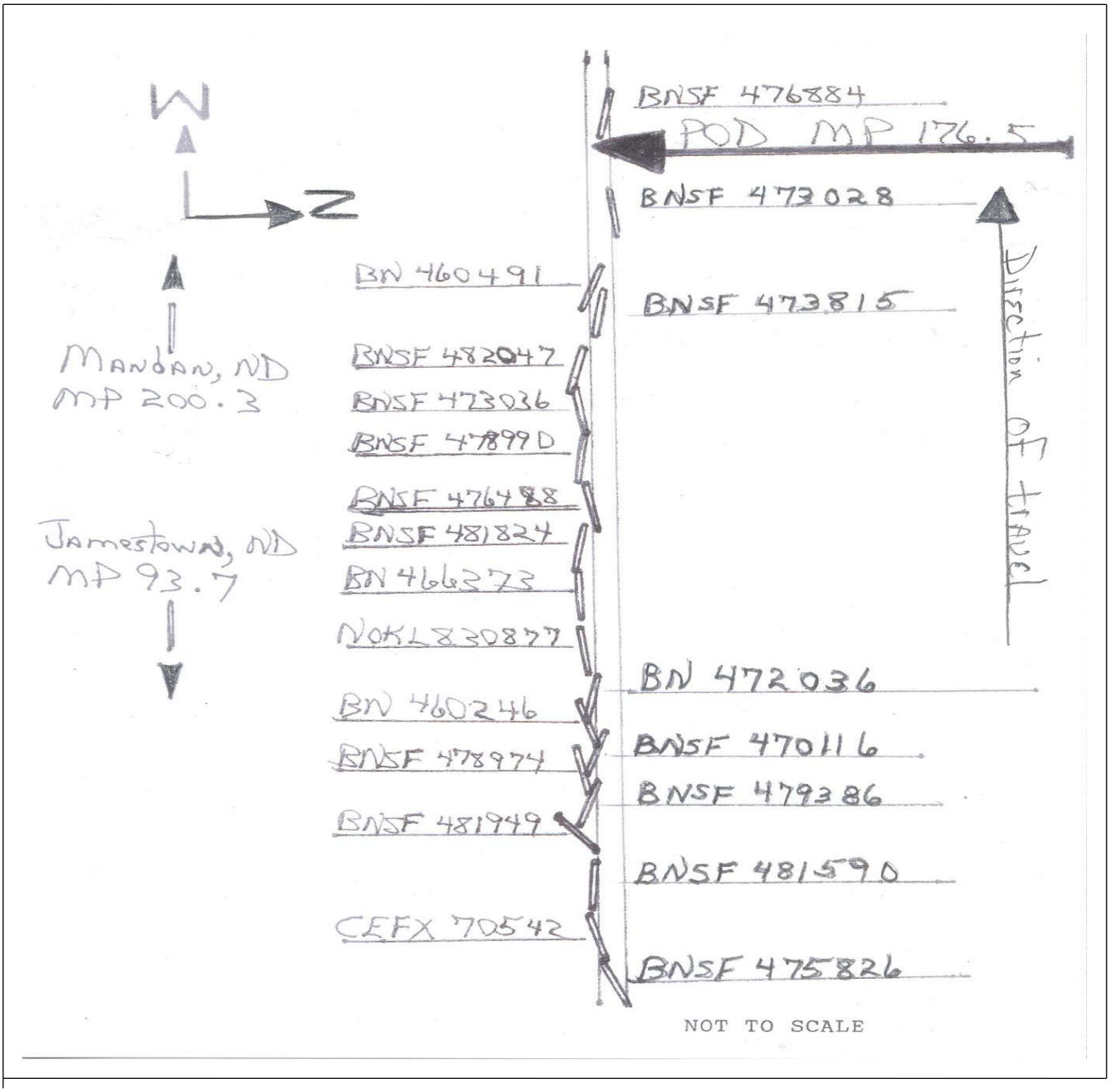
105. Locomotive Auxiliary Lights Operational? 1. Yes 2. No
Code: N/A

106. Locomotive Headlight Illuminated? 1. Yes 2. No
Code: N/A

107. Locomotive Audible Warning Sounded? 1. Yes 2. No
Code: N/A

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

HQ-64-
2006
Sketch.jpg



109. SYNOPSIS OF THE ACCIDENT

On July 16, 2006, at 3:15 p.m., Central Daylight Time (CDT) a westbound BNSF Railway Company (BNSF) freight train (G-BREINB-9-16) derailed. The accident occurred at McKenzie, North Dakota, on a single main track at about milepost 176.5, on the Twin Cities Division, Jamestown Subdivision.

The train consisted of three locomotives, 110 loaded cars, 15,600 trailing tons and was 6,598 feet in length. A total of 20 cars, 21st and 26th, and 28th through the 45th, derailed. There were no injuries reported and no release of hazardous materials. The estimated damage for the derailment was $992,601 ($275,200 track and $717,401 equipment).

At the time of the derailment it was daylight and clear. The temperature was 105° F.

The probable cause of the accident was track alignment irregular (Buckled/Sunkink) (T109).

110. NARRATIVE

Circumstances Prior to the Accident

On July 16, 2006 after completing more than the statutory off duty time, a crew consisting of a engineer and a conductor reported for duty at Dilworth, Minnesota at 8:20 a.m. CDT , their home terminal. The crew was assigned to operate a westbound BNSF freight train (G-BREINB-9-16) between Dilworth and Mandan, North Dakota, a distance of 200 miles.

The train consisted of three locomotives (two in the lead and one in the rear of the train), 110 loaded grain cars, 15,600 trailing tons, and was 6,598 feet in length. The daily locomotive inspections were done on July, 15, 2006 at Grand Forks, North Dakota and an initial terminal air brake test was done on July 16, 2006. The crew boarded the train and departed Dilworth at about 9:35 a.m.

The train approached the derailment area traveling geographically and timetable west. Timetable directions will be used throughout this report. The locomotive engineer was seated at the controls on the right (north) side of the leading locomotive. The conductor was seated on the left (south) side of the cab of the leading locomotive.

Approaching the accident site from east to west starting at about mile 174.7, there is a tangent for 7,392 feet, and then a left hand 1-degree 4-minute curve for 2,112 feet to the point of derailment and 1,848 feet beyond. The grade approaching the derailment is a 0.40 percent descending grade from mile 174.7 to 176.0, and a 0.22 percent descending grade from mile 176.0 to 176.1, and a 0.0 percent grade from mile 176.1 to the point of derailment and 8,448 feet beyond.

According to the train crew, as the train approached the accident area, the trip had been uneventful.
The Accident
As the train approached the accident site and at the time the accident occurred, the train was being operated at a recorded speed of 21 miles per hour (mph). The speed was recorded by the event recorder of the controlling locomotive.

In the accident area, trains operate on a single main track under the authority of a Track Warrant Control System (TWC), controlled by a dispatcher in Fort Worth, Texas and supplemented by signal indications of an Automatic Block System (ABS). The maximum authorized speed for freight trains is 50 mph as designated in the current BNSF Timetable No. 2.

According to the train crew, the train made a train line induced emergency air brake application of the train air brakes and came to a stop. After coming to a stop, the engineer notified the train dispatcher of the train line induced emergency air brake application . The conductor walked back to inspect the train and determined that several freight cars had derailed.

Analysis and Conclusions
The accident did not meet the requirement for FRA Post Accident Toxicology Testing, as required under Title 49 CFR, Part 219, Subpart C.

The trackside failed equipment detector located at mile 172.8 recorded no defects on the train when it traversed over the detector about four miles in advance of the accident area.

A thorough inspection of the derailed equipment revealed no evidence of mechanical defects that would contribute to the cause of the accident.

An inspection of the data print out from the lead locomotive event recorder indicated that the train was being operated at 21 mph at the location of the POD. The

event recorder also indicated no unusual events related to train handling.

The investigation revealed the train derailed due to a thermal track buckle at mile 176.5.

On July 14 and 15, 2006, a BNSF track inspector conducted a track inspection by traversing the track with a hi-rail vehicle between milepost 93.0 and milepost 192.0 . No defective conditions were noted in the accident area.

A total of 20 loaded freight cars derailed (21st and 26th freight cars, and the 28th through the 45th freight cars from the head end of the train).

There were no injuries reported and no release of hazardous materials.

The estimated damage for the derailment was $992,601 ($275,200 track and $717,401 equipment).

Probable Cause

An investigation conducted by the Federal Railroad Administration found that the probable cause of the derailment was track alignment irregular (Buckled/Sunkink) (T109).