Inv-2354

INTERSTATE COMMERCE COMMISSION

WASHINGTON

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REPORT OF THE DIRECTOR

BUREAU OF SAFETY

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ACCIDENT ON THE

MISSOURI PACIFIC RAILROAD

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SCOTT, MO.

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May 26, 1939

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INVESTIGATION NO. 2354

SUMMARY

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Inv-2354

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| Railroad: | Missouri Pacific |
| Date: | May 26, 1939 |
| Location: | Scott, Mo. |
| Kind of accident: | Derailment |
| Train involved | Freight |
| Train number: | 92 |
| Engine number: | 1409 |
| Consist: | 45 cars and caboose |
| Speed: | 30-35 m.p.h. |
| Operation: | Timetable, train orders, and automatic block-signal system |
| Track: | Single; tangent; 0.60 percent descending eastward |
| Weather: | Cloudy |
| Time: | About 10.57 p.m. |
| Casualties: | 2 killed |
| Cause: | Washout |

June 28, 1939.

To the Commission:

On May 26, 1939, there was a derailment of a freight train on the Missouri Pacific Railroad near Scott, Mo., which resulted in the death of two employees.

Location and Method of Operation

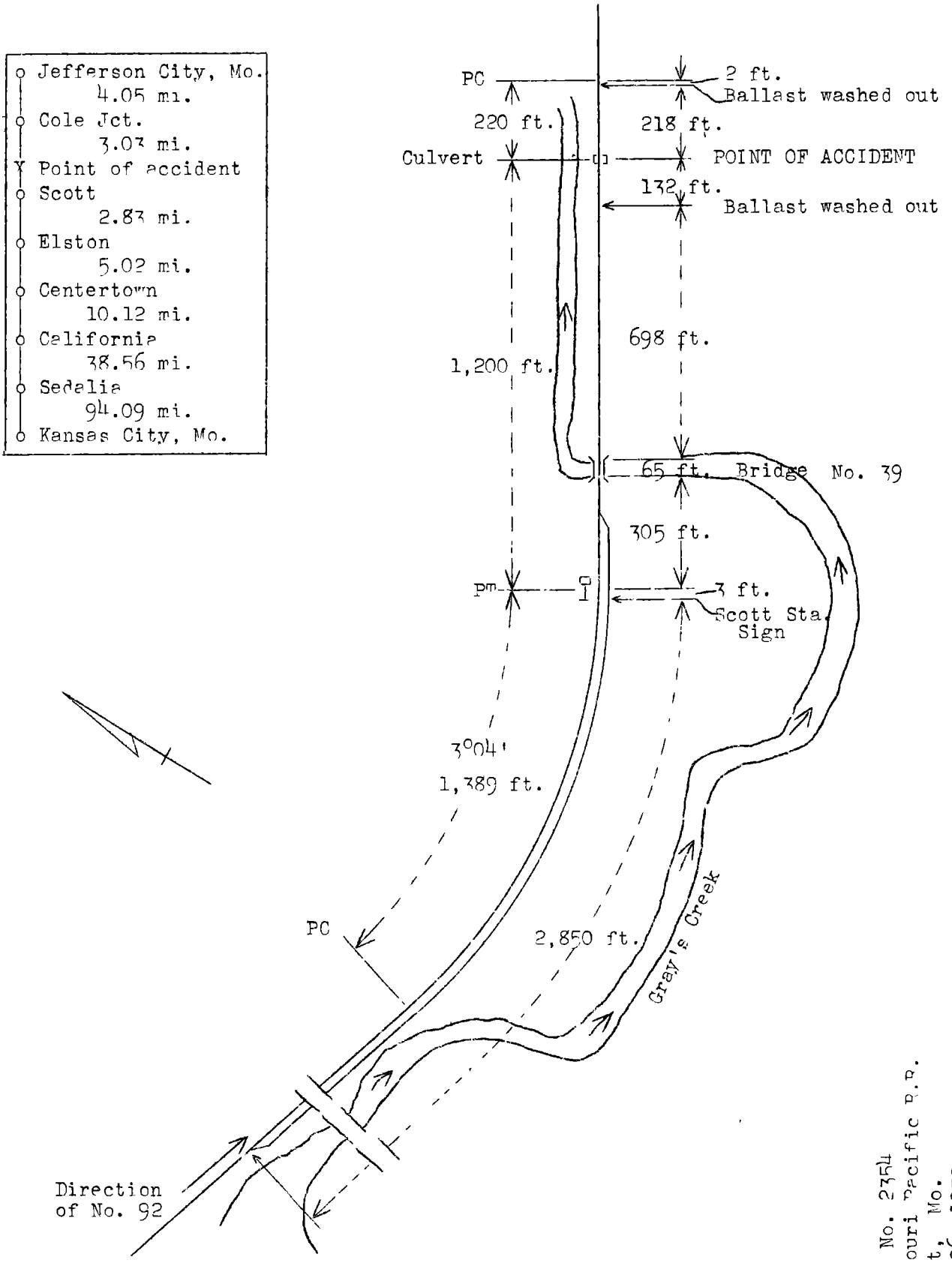
This accident occurred on that part of the Eastern Division designated as the Sedalia District which extends between Kansas City and Jefferson City, Mo., a distance of 157.70 miles. In the vicinity of the point of accident this is a single-track line over which trains are operated by timetable, train orders, and an automatic block-signal system. The derailment occurred at a point approximately 1,203 feet east of the station at Scott. Approaching from the west there is a 3° 04' curve to the left 1,389 feet in length, followed by a tangent 1,200 feet to the point of derailment and 220 feet beyond. The grade for east-bound trains is practically level a distance of about 1,900 feet, then 0.60 percent descending 1,700 feet to the point of accident and 300 feet beyond.

The track structure consists of 90-pound rail, 33 feet in length, laid on 18 treated ties to the rail length. It is single-spiked, fully tieplated, provided with eight rail anchors to the rail length, ballasted with chatt to a depth of 18 inches, and is well maintained.

At a point 373 feet east of the station at Scott, Gray's Creek flows from the south to the north side of the track under Bridge No. 39, its course then being eastwardly close to the track. The level of the stream bed is about 23 feet below the base of the rail. In the vicinity of the point of accident the track is laid on a fill about 5 feet high and 1,200 feet long. About 1,203 feet east of the station there is a concrete box-culvert 10 feet high, 10 feet wide, and 24 feet long laid transversely under the fill. This culvert provides drainage from a basin on the south side of the track to Gray's Creek; the derailment occurred at this culvert.

The maximum authorized speed for freight trains is 45 miles per hour.

Rule 330 of the rules and instructions for the maintenance-of-way and structures reads in part as follows:




Inv. No. 2354
Missouri Pacific R.R.
Scott, Mo.
May 26, 1939

"During heavy storms or high water, whereby tracks or any portion of the Company's property becomes liable to damage, Foremen and trackmen must be on duty, whether by day or night, and at such times they must carefully patrol their entire sections to make sure that the track is safe, taking stop signals with them.

"Where there is any liability or damage to the track, either from freshet or other cause, Foremen must make frequent personal examinations of the conditions to insure the safety of trains.***

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"They shall go over their sections during, or immediately after, a heavy rainfall taking care of all emergency conditions that they find and 'spotting out' locations where ditches have been filled up and where trouble will be experienced unless ditches are cleaned out and made of sufficient capacity to provide proper run-off."

There had been light showers intermittently during the afternoon of May 26, and between 7 and 8 p.m., there was a heavy rain which continued about one hour. The weather was cloudy at the time of accident, which occurred about 10:57 p.m.

## Description

No. 92, a third-class east-bound freight train, consisted of 45 cars and a caboose, hauled by engine 1409, and was in charge of Conductor Lane and Engineman Love. This train left Kansas City, 150.62 miles west of Scott, at 12:01 p.m. according to the train sheet, on time, and performed station work en route. It departed from California, the last open office, 17.97 miles west of Scott, at 10:30 p.m., 3 hours 40 minutes late, and shortly after passing Scott was derailed at a washout while traveling at a speed estimated to have been between 30 and 35 miles per hour.

The engine, tender and first 21 cars were derailed. The engine, badly damaged, stopped on its left side parallel to the track with the front end about 200 feet east of the culvert. The tender stopped on the north side of the track at an angle of about 45 degrees to the rear of the locomotive. The first to the nineteenth cars, inclusive, which were either damaged or destroyed, stopped in various positions on each side of the track. The twentieth and twenty-first cars remained in upright position and in line with the track. All the derailed equipment stopped within a distance of about 335 feet. The track was considerably damaged. The employees killed were the engineman and the fireman.

Summary of Evidence

Head Brakeman Webb stated that an air-brake test was made at Sedalia, 56.53 miles west of Scott, and the brakes functioned properly en route. He talked with the engineman and the fireman at California and they appeared to be normal. Approaching Scott he occupied the brakeman's cabin on the rear of the tender. He stated that the weather was cloudy and he did not see any water along the right-of-way, and there were no indications that the engine was running through water. The headlight of the engine was burning, and west of Scott he heard the engine whistle sounded. The engineman had applied the brakes just west of Scott station, then they were released and no further application of the brakes was made until the accident occurred. The first intimation he had of the accident was when the engine went into a hole and after striking the culvert it rose, plunged forward, and turned over in the water. He estimated that the speed was 30 or 35 miles per hour at the time of the accident. He estimated that the water covered the track to a depth of 3 or 4 inches, and extended west of the pilot of the engine.

Conductor Lane stated that when they departed from California a drizzling rain was falling. Approaching Scott he was in the cupola of the caboose and observed that it had been raining in this vicinity but did not know to what extent. The train was maintaining the usual speed of 30 or 35 miles per hour, and it was his opinion that the engineman observed the submerged track and applied the brakes in emergency just prior to the derailment. He said that he had never previously observed high water in Gray's Creek.

Swing Brakeman Blockberger stated that between California and Scott he occupied the right side of the cupola of the caboose and did not observe any rain en route; however, he observed that it had been raining as he saw some water in a field on the south side of the track at a point about half a mile west of Scott. The first knowledge he had of anything wrong was when the brakes became applied in emergency, which caused a run-in of the caboose and then there was a severe rebound. Shortly thereafter as he proceeded on the south side of the track toward the engine, he observed that the water under Bridge No. 39 was not up to the rails; he found no water on the track until he reached the derailed cars, at which point it was about level with the top of the track. Because of the rapid flow of the water he could not reach the engine; he then returned to the rear of the train to inform the conductor of the situation. Later, he accompanied the conductor to the head end of the train and

observed that the water had receded. It was his opinion that the engine crew had no warning that the track was submerged.

Flagman Crump was on the left side in the cupola of the caboose and stated that he did not observe any water in the vicinity of Scott until the swing brakeman called his attention to water in the field south of the station. At this point there is a siding, located on the south side of the main track, and he estimated that the water was about 2 feet lower than the siding. He has been employed on this district for the past 8 years and on several occasions had observed Gray's Creek overflowing its banks but never flowing over the tracks.

The engine crew of No. 19, a west-bound passenger train and the last train to pass through the territory involved prior to the accident, stated that they departed from Jefferson City, located 7.08 miles east of Scott, at 8:04 p.m., and passed Scott about 8:20 p.m. The showers they encountered en route did not indicate any alarming condition and when crossing Gray's Creek they did not observe high water. The engineman said that he had never observed the water in this creek to be of such volume as to endanger the track and he did not recall any orders having been issued to restrict the speed of trains in the vicinity of the point of accident. It was his opinion that, because of the curve, the reflection of the headlight of an engine would not enable the engineman to see the inundated track in time to avert the accident.

Train Dispatcher Green, on duty at Cole Junction, located 3.03 miles east of Scott, stated that he observed light showers prior to the time he reported for duty at 4 p.m. There was a light rain about 6 p.m., and about 8:15 p.m. he observed that it was raining harder. He talked with several operators, between Jefferson City and Kansas City, who reported light rains. Having received no other information, he did not think the rainfall and water conditions warranted calling out section men to patrol the track or issuing orders to restrict the speed of trains. About 10:57 p.m. the telegraph and telephone system failed.

Section Foreman Choate, located at Elston, 2.83 miles west of Scott, in charge of the section on which the accident occurred, stated that between 7 and 8 p.m. there was a hard shower, and later, when there was a light rain, he inspected the track in the vicinity of his headquarters to determine the amount of precipitation. He decided that the rainfall was normal, the track was not endangered, and there was no condition to warrant the patrolling of his entire section. He retired at 9:30 p.m., at which time it was raining

lightly. He said that the drainage area of Gray's Creek is such that it permits the channel to fill quickly, although during the four years he has been employed on this section, he had observed only twice that this stream overflowed its banks. In each of these instances the water was not high enough to reach the track. The locality where the washout occurred was not considered a point that required special attention. He had never requested the issuance of orders to restrict the speed of trains to protect the track in this vicinity.

Section Foreman Buchanan, in charge of the adjoining section to the east, stated that he was at his home at Cole Junction and observed a heavy rain between 8:30 and 9 p.m. Shortly before 9:30 p.m., he made several inspections of Bridge No. 35, located about 3 miles east of Scott, and also of culverts and found they were adequately taking care of the water. He said that while the water in Gray's Creek was above its normal stage, it was not as high as he had observed it to be on previous occasions. He thought that the rainfall in the vicinity of his section on the night in question was not such as to necessitate patrolling the entire section.

Roadmaster Payne stated that between 6:25 and 7:50 p.m., on the day of the accident, he rode over the territory between Jefferson City and Sedalia and encountered only light showers. He arrived at the scene of the accident about 1:45 a.m., May 27, and his inspection disclosed that the only portion of the track from which the ballast had been washed was in the immediate vicinity of the point of derailment. He assumed supervision of this district in January, 1938. He said that the normal depth of Gray's Creek was about 2½ feet and this was the first time he had known of this stream reaching flood stage. It was his opinion that this high water was the result of heavy rains which fell at some remote portion of the drainage area south of the railroad.

Division Engineer Knecht arrived at the scene of the accident about 4 a.m., May 27, and observed that the water had receded into the regular channel of Gray's Creek. He found that the ballast had been washed from the track from a point 132 feet west of, to a point 218 feet east of, the concrete culvert. Water marks on the culvert showed that the water had reached a height of about 4.8 inches above the base of the south rail. There were no indications of drift material having obstructed the channel of the stream. It was his opinion that this flood was the result of a cloudburst at some point from ½ to 1½ miles distant from the railroad. He thought that the high water had receded very shortly before No. 92 arrived at Bridge No. 39. He stated that the rainfall at Cole Junction and Elston was not excessive and conditions

did not warrant the track being patrolled by section men.

Subsequent to the accident Principal Assistant Engineer Neptune, in company with the division engineer and the assistant engineer, made an inspection of the right-of-way and adjacent land from Cole Junction to Scott. The principal assistant engineer stated that the larger part of the watershed extends a distance of 4 miles south of the railroad, and its western divide crosses the railroad about 5½ miles west of Scott. An examination of the tributaries in the western and northern part of the watershed and the territory adjacent to the railroad disclosed that channels and openings under the highways and railroad had carried a normal amount of water. However, on Highway No. 50, or about 2¼ miles south of Bridge No. 39, there were two openings which showed indications of having been overtaxed. As there are no official rainfall recording stations in the watershed at Gray's Creek, he secured information from residents in this area indicating that there had been light showers intermittently during the afternoon of May 26, and about 7 or 7:30 p.m., the rainfall increased to cloudburst proportions, which continued about one hour, resulting in about 4 inches of rainfall. As the ground was saturated by the earlier showers, this excessive rain produced a one hundred percent run-off in the affected area. He said that there was from 5 to 6 feet of overflow in Gray's Creek at Bridge No. 39. It was his opinion that the flood was the result of a heavy rain storm which had centered over the extreme southern part of the watershed. He stated that the water over the track would not cause the signals to display stop indications.

The statements of A. Bandelier and Theodore Bandelier, who reside about 1½ miles south of Elston station, were to the effect that between 7 and 8 p.m., May 26, there was a rainfall of about 4 inches. A. Bandelier stated that this was the most severe rainfall he had witnessed in his 75 years of residence at this point.

From data furnished by the railroad, it was disclosed that in March, 1927, water had attained a height of within 5.6 feet of the base of the rail at Bridge No. 39. In this instance the water overflowed the banks and washed out about 40 feet of ballast at the location involved in this accident, and several months later the concrete culvert was installed. During 1929, water came within 8.6 feet of the base of the rail at Bridge No. 39, but the track was not endangered. No further action was taken to meet high water conditions at this point.

Reports of the Weather Bureau for the 24-hour period ended 6:30 a.m., May 27, indicated heavy rainfall within a radius of 40 miles of Scott. The heaviest rainfall recorded was 2.72 inches at the southern limits of Jefferson City, and from information obtainable, most of this rainfall occurred between 7 and 9 p.m., May 26. Jefferson City is the nearest recording station to Scott and is located about 3 miles from the watershed of Gray's Creek.

## Discussion

The evidence was to the effect that a great quantity of rain had fallen over the extreme southern part of the watershed about 2½ or 3 hours previous to the accident. The water from this area entered Gray's Creek which overflowed its banks, and filled the basin along the south side of the track. The water covered the track in the vicinity of the culvert to a depth of 4.8 inches above the base of the south rail, and evidently the flow was of such force as to wash out about 350 feet of ballast from under the track.

According to the testimony, the weather was cloudy when No. 92 approached the point of accident at a speed estimated to have been between 30 and 35 miles per hour; the headlight of the engine was burning. Approaching the culvert involved the view of the track was restricted because of track curvature. As the engineman and the firemen were killed in the accident it is not known when they first observed the submerged track; however, according to the statements of two members of the train crew, an emergency application of the air brakes was made about the time the derailment occurred, which would indicate that they had no warning of the washout until it was too late to avert the accident.

The evidence also indicates that only light showers prevailed along the railroad at the time of the storm in the southern portion of the drainage area. The dispatcher had reports from several operators of light showers but did not think the rainfall warranted calling out the section men to patrol the track or issuing orders to restrict the speed of trains. The section foreman in charge of the section on which the accident occurred and the section foreman on the adjoining section east made observations of the track in the vicinity of their headquarters and found no unusual conditions. The heavy rainfall occurred a considerable distance from the railroad, and no employee had any knowledge of it; for this reason no action was taken to patrol the track. A westbound passenger train, the last train through this territory prior to the derailment, passed about 8:20 p.m., at which time the

engine crew observed nothing unusual.

According to data furnished by the railroad, in 1927 a flood caused a washout of about 40 feet of ballast at the location involved in this accident and subsequently the concrete culvert was installed. In 1929, there was high water in this vicinity but as it did not endanger the track no additional action was taken to meet high water conditions at this point.

Conclusion

This accident was caused by a washout.

Respectfully submitted,

W. J. PATTERSON,

Director.