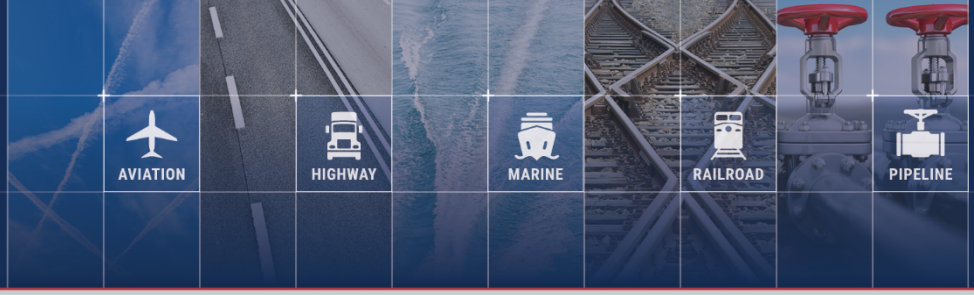

Aviation Investigation Final Report

Location:	Vero Beach, Florida	**Accident Number:**	ERA18LA145
Date & Time:	May 7, 2018, 10:43 Local	**Registration:**	N80813
Aircraft:	Piper PA28	**Aircraft Damage:**	Substantial
Defining Event:	Fuel contamination	**Injuries:**	2 None
Flight Conducted Under:	Part 91: General aviation - Instructional		

Analysis

The flight instructor and student pilot were conducting an instructional flight. As the student turned the airplane from the base leg to the final leg of the traffic pattern, the engine lost total power, so the instructor assumed control of the airplane. He attempted remedial actions to no avail, so he chose to conduct a forced landing to a railroad bed before the approach end of the runway. The airplane landed hard, which resulted in the right main landing gear and nose landing gear separating from the airplane.

Fuel drained from the airplane during recovery contained large quantities of water. After recovery, a fresh source of fuel was plumbed into the fuel system, and the engine started and ran smoothly. Given that the engine was successfully test-run with fresh fuel after the accident, it is likely that the loss of engine power was due to water contamination of the fuel supply.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be:

Water contamination of the fuel supply, which resulted in a total loss of engine power.

Findings

Aircraft	Fuel - Fluid condition

Factual Information

History of Flight

Approach-VFR pattern final	Fuel contamination (Defining event)
Approach-VFR pattern final	Attempted remediation/recovery
Landing-flare/touchdown	Off-field or emergency landing

On May 7, 2018, at 1043 eastern daylight time, a Piper PA-28-161, N80813, operated by Paris Air Inc, was substantially damaged during a forced landing, after a total loss of engine power while on approach to Vero Beach Regional Airport (VRB), Vero Beach, Florida. The flight instructor and a student pilot were not injured. Visual meteorological conditions prevailed, and no flight plan was filed for the instructional flight which was conducted under the provisions of Title 14 *Code of Federal Regulations* Part 91.

The flight instructor and the student pilot each provided written statements, and their recounting of events was consistent throughout. According to the student pilot, he had completed a right traffic pattern and as he turned the airplane from the base leg to the final leg, the engine power was "decreasing" and did not respond when he increased the throttle setting. At that point, he surrendered the flight controls to the instructor.

According to the flight instructor, as he assumed control of the airplane the engine "started running extremely rough" and the propeller rotated slowly. He initiated the "engine failure" checklist but could not complete it due to the lack of available time and altitude and instead chose to perform a forced landing to the railroad bed that was about 1/4 mile prior to the approach end of the runway and oriented perpendicular to the final approach course. The flight instructor turned the airplane to the right, aligned with the railroad tracks, and landed "hard," which separated the right main and nose landing gear.

The flight instructor held a commercial pilot certificate with ratings for airplane single-engine land, multiengine land, and instrument airplane. He held a flight instructor certificate with a rating for airplane single-engine. The flight instructor was issued a first-class medical certificate on April 7, 2015. He reported 491 total hours of flight experience, of which 456 hours were in the accident airplane make and model.

The student pilot was issued a Federal Aviation Administration (FAA) student pilot certificate and a first-class medical certificate on August 17, 2017.

According to FAA records, the airplane was manufactured in 1979 and had accrued 12,557.3 total aircraft hours. Its most recent 100-hour inspection was completed May 1, 2018 at 12,544.8 total aircraft hours.

At 1053, the weather recorded at VRB included clear skies and wind from 040° at 5 knots. The temperature was 27°C, and the dew point was 20°C. The altimeter setting was 29.99 inches of mercury.

During recovery of the airplane, both main wing tanks and the carburetor float bowl were drained. Samples of the drained fuel were collected in 2 one-pint bottles and a one-quart bottle. The contents of each were divided approximately one-third fuel and two-thirds water.

After recovery, an NTSB investigator connected an external fuel tank at the gascolator output and primed the engine. The carburetor case was cracked due to impact, and fuel dripped from the crack when the system was primed. An engine start was attempted, and after about two revolutions of the propeller, the engine started. According to the investigator, the engine ran smoothly after start, but he stopped the engine after a brief period due to the fuel leak.

Flight instructor Information

Certificate:	Commercial; Flight instructor	**Age:**	27,Male
Airplane Rating(s):	Single-engine land; Multi-engine land	**Seat Occupied:**	Right
Other Aircraft Rating(s):		**Restraint Used:**	3-point
Instrument Rating(s):	Airplane	**Second Pilot Present:**	Yes
Instructor Rating(s):	Airplane multi-engine; Airplane single-engine; Instrument airplane	**Toxicology Performed:**	No
Medical Certification:	Class 1 Without waivers/limitations	**Last FAA Medical Exam:**	April 7, 2015
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	
Flight Time:	491 hours (Total, all aircraft), 456 hours (Total, this make and model)		

Student pilot Information

Certificate:		**Age:**	19,Male
Airplane Rating(s):	None	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	3-point
Instrument Rating(s):	None	**Second Pilot Present:**	Yes
Instructor Rating(s):	None	**Toxicology Performed:**	No
Medical Certification:	Class 1 With waivers/limitations	**Last FAA Medical Exam:**	August 17, 2017
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	
Flight Time:	10 hours (Total, all aircraft), 10 hours (Total, this make and model)		

Aircraft and Owner/Operator Information

Aircraft Make:	Piper	**Registration:**	N80813
Model/Series:	PA28 161	**Aircraft Category:**	Airplane
Year of Manufacture:	1979	**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	28-8016057
Landing Gear Type:	Tricycle	**Seats:**	4
Date/Type of Last Inspection:	May 1, 2018 100 hour	**Certified Max Gross Wt.:**	2326 lbs
Time Since Last Inspection:	12 Hrs	**Engines:**	1 Reciprocating
Airframe Total Time:	12557.3 Hrs at time of accident	**Engine Manufacturer:**	LYCOMING
ELT:	Installed, not activated	**Engine Model/Series:**	O-320 SERIES
Registered Owner:		**Rated Power:**	160 Horsepower
Operator:		**Operating Certificate(s) Held:**	Pilot school (141)

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	KVRB,28 ft msl	**Distance from Accident Site:**	0 Nautical Miles
Observation Time:	10:53 Local	**Direction from Accident Site:**	201°
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	5 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	40°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	29.98 inches Hg	**Temperature/Dew Point:**	27°C / 20°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Vero Beach, FL (VRB)	**Type of Flight Plan Filed:**	None
Destination:	Vero Beach, FL (VRB)	**Type of Clearance:**	VFR
Departure Time:		**Type of Airspace:**	Class D

Airport Information

Airport:	VERO BEACH RGNL VRB	**Runway Surface Type:**	Asphalt
Airport Elevation:	23 ft msl	**Runway Surface Condition:**	Dry
Runway Used:	30R	**IFR Approach:**	None
Runway Length/Width:	3504 ft / 75 ft	**VFR Approach/Landing:**	Forced landing;Traffic pattern

Wreckage and Impact Information

Crew Injuries:	2 None	**Aircraft Damage:**	Substantial
Passenger Injuries:		**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	2 None	**Latitude, Longitude:**	27.655555,-80.418052(est)

Administrative Information

Investigator In Charge (IIC):	Rayner, Brian
Additional Participating Persons:	Brian Humphries; FAA/FSDO; Orlando, FL
Original Publish Date:	April 30, 2019
Note:	The NTSB did not travel to the scene of this accident.
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=97200