



Virginia Department of Forestry
Accident Investigation Report
Quaker Run Fire, Dozer Rollover

October 28, 2023



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ACCIDENT INFORMATION

ACCIDENT: Dozer Rollover

LOCATION: Division Foxtrot, Quaker Run Fire, Madison County, Virginia

DATE: October 28, 2023

ACCIDENT INVESTIGATION TEAM

TEAM LEADER/ LEAD INVESTIGATOR:

Chad Briggs
Safety/Training Coordinator, Virginia Department of Forestry

EXECUTIVE SUMMARY

The Quaker Run Fire began on Oct. 24, 2023. The fire was located in steep, rough terrain near the town of Syria in Madison County, Virginia. On Oct. 28, 2023, the Virginia Department of Forestry (DOF) was well engaged in fire suppression operations on the fire. The fire was being managed as a Type 3 incident with a qualified incident commander and safety officer. A local EMS unit was staged at the incident command post (ICP) and air operations were planned to take place.

The Incident Action Plan (IAP) for that day listed the objectives as:

- ◆ Provide for firefighter and public safety.
- ◆ Protect structures.
- ◆ Keep fire east of Shenandoah National Park.
- ◆ Keep fire north of structures on Quaker Run Road.
- ◆ Keep fire south of structures on Finks Hollow Road.
- ◆ Keep east flank on Doubletop Mountain.

(Refer to Map #1)

The fire had been divided into four divisions with division supervisors and separate radio channels assigned. The incident was operating on one command channel as is routine for an incident of this size. Division Foxtrot was to carry out construction of fireline from 131 Finks Hollow Road. Two DOF resources were assigned to this division. Engine-612 with two personnel, and Rappahannock dozer (RAP-50) with one dozer operator and one dozer lead (swamper) person. A second dozer was added later in the shift, Warren dozer (WAR-50). WAR-50 had been down for repairs initially and, therefore, did not appear in the original IAP. The operational period was from 08:00 until 20:30 that day.

Weather

Weather for Oct. 28 was:

Mostly sunny

Precipitation – 10-20% chance of an isolated shower late in the afternoon

Wind – 5-7 mph out of the west; smoke dispersal was rated as “poor” for the early morning and increasing to “excellent” in the afternoon

RH – 50% minimum

Temperature – 80°F maximum

Chronology of Events

09:00 – The division supervisor conducted a safety briefing following the operations briefing. E-612 was assigned to structure protection at 131 Finks Hollow Road.

10:00 – Now repaired, WAR-50 was assigned to construct fireline westward to drop point 10.

10:45 – RAP-50 was assigned to follow the swamper and construct fireline along the contour of the ridge.

12:00 – A reassessment of RAP-50's progress was made by having its personnel report back to the ridgetop. A discussion took place about the "rocky" terrain, safety, seatbelt usage and to operate only where comfortable.

13:30 – RAP-50 swamper established a new line coming off a finger ridge to tie into the 131 Finks Hollow Road group.

13:23 – RAP-50 swamper informed Division Foxtrot that he had injured his knee and could only go downhill walking. At this point, the swamper walked towards the bottom of the ridge but remained in radio contact with the operator. The swamper was not directly with the dozer operator after the knee injury. The dozer continued to work its way down hill. At one point, the dozer tried to climb out of a drainage in the direction he had come from, but this area proved too steep to climb out.

16:04 – Division Foxtrot was notified by the RAP-50 operator that he had "rolled the dozer". Operations was immediately notified and an "incident within an incident" was begun. All operations on Division Foxtrot were immediately halted to verify the safety of the operator, and to confirm that all other division resources were accounted for.

16:10 – An inspection of the dozer and operator was made. The operator was found to be unhurt except for a cut on the hand.

16:35 – The safety officer arrived to view the dozer and operator. RAP-50 operator was transported via UTV to the Madison County EMS unit on the scene and checked out. The hand wound was bandaged and the operator was not transported to the hospital.

17:20 – All resources were removed from Division Foxtrot and traveled back to the ICP.

(Refer to Map #2 and Map #3)

The RAP-50 operator stated in interviews, "I was pushing fireline downhill in steep, rocky terrain." Note that the line was being pushed in area of the fire that had already burned. "I had the blade loaded with dirt and brush going through a narrow section in a rock ledge." At one point, the operator was unable to proceed any further and had to back up 20-30 yards and re-adjust his angle downhill. This veered the dozer toward the rock ledge of which he was unaware and was not able to see due to the dust and smoke. The swamper had already hiked ahead of the dozer to scout for a better route when the swamper fell and injured his leg. The operator

had already tried to back out and go back uphill with no success climbing the steep grade. The swamper was not in visual sight of the dozer and only had radio communication with the operator. While re-adjusting the position, the dozer's right track ran onto a rock that the operator could not see, the steep incline and weight of the dozer caused the track to slip off the rock. This caused the dozer to roll onto its roof.

In interviews, the swamper stated that he had hiked ahead of the RAP-50 to locate more favorable terrain for the dozer to traverse, to meet their objective for the day. He had fallen downhill and injured his leg while hiking. The operator then attempted to turn RAP-50 around without him giving the operator visual guidance. Soon after, the operator radioed that he had "rolled the dozer".

(Refer to Photos 1 through 13)

FINDINGS

Finding 1:

RAP-50 was working in steep, rocky terrain, that needed the assistance of a swamper.

Finding 2:

RAP-50 was being operated by a seasoned, experienced part-time DOF operator.

Finding 3:

RAP-50 was using the aid of a swamper.

Finding 4:

There was radio communication between the operator and the swamper.

Finding 5:

The Division Foxtrot supervisor had given a discussion and emphasis on safety at 12:00 prior to the rollover.

Finding 6:

An IAP for the fire was created with a Communications Plan (ICS-205) on Oct. 28.

Finding 7:

No Medical Plan (ICS-206) was included in the Oct. 28 IAP. It was included starting Oct. 29.

Finding 8:

The incident was classified as a Type 3 Incident and had a qualified Type 3 incident commander.

Finding 9:

The incident had a qualified safety officer assigned on Oct. 28.

Findings 10:

Madison County EMS support was present at the ICP the day of the rollover.

CAUSES

Cause 1:

RAP-50 swamper had hiked ahead of the dozer to scout a new route. Swamper and operator were no longer in visual contact with each other.

Cause 2:

RAP-50 operator attempted to maneuver and turn around without the visual assistance of the swamper.

RECOMMENDATIONS

Recommendation 1:

Have a Rapid Extrication Module Support (REMS) or similar type unit standing by on Type 3 incidents that could handle complex medical incident situations.

Once the Gold Team took over management of the fire, a REMS unit was brought in from Roanoke County Fire & Rescue and staged on the fire. Most local fire/EMS systems in rural areas of the state do not possess the trained personnel or specialty equipment to assemble a REMS unit. These units would need to be brought in from other parts of the state. These units are invaluable with their abilities to extricate, treat and transport wildland firefighters from emergency situations.

Had the RAP-50 operator been seriously injured or required extrication, there was no plan or needed equipment on standby to treat and transport the operator to an awaiting ambulance or medical helicopter.

We can no longer adopt the philosophy "It will never happen here."

Recommendation 2:

On Type 3 incidents, have trained EMTs or paramedics roving the divisions in all-terrain vehicles.

Recommendation 3:

Reinforce to dozer operators that when working in steep, rocky terrain, do not make maneuvers without the aid of a swamper within visual and audible communication.

Recommendation 4:

When a dozer is operating in steep, rocky terrain, utilize two dozers in one area whenever possible. This will give the ability of more resources to be utilized in the event of an emergency.

(Refer to Photo #14)

Recommendation 5:

Use drones or other air assets to scout large, steep areas to maintain personnel safety.

Recommendation 6:

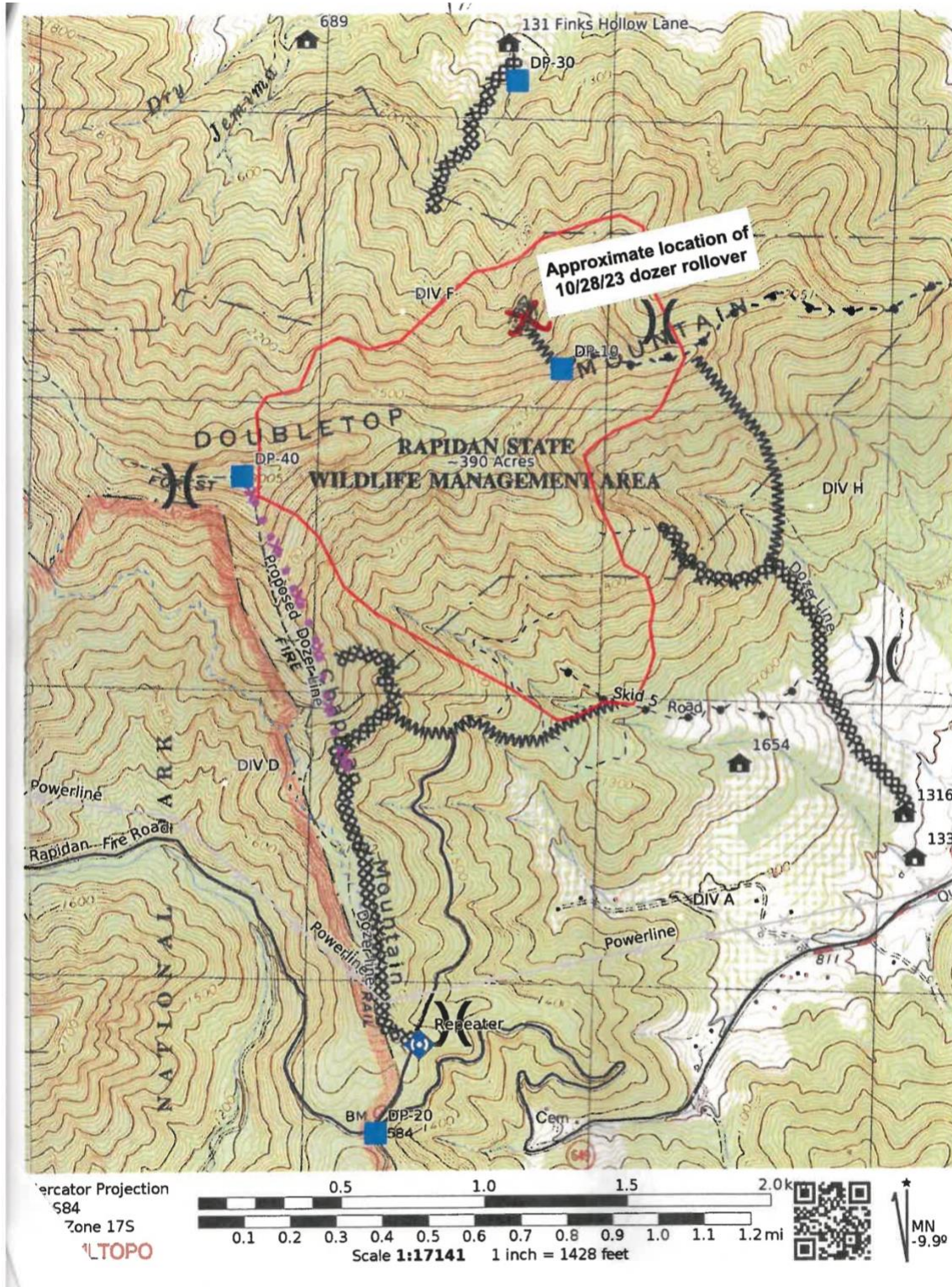
Always have items in the dozer cab secured. In the event of a rollover, those items will become projectiles and can cause injuries.

Recommendation 7:

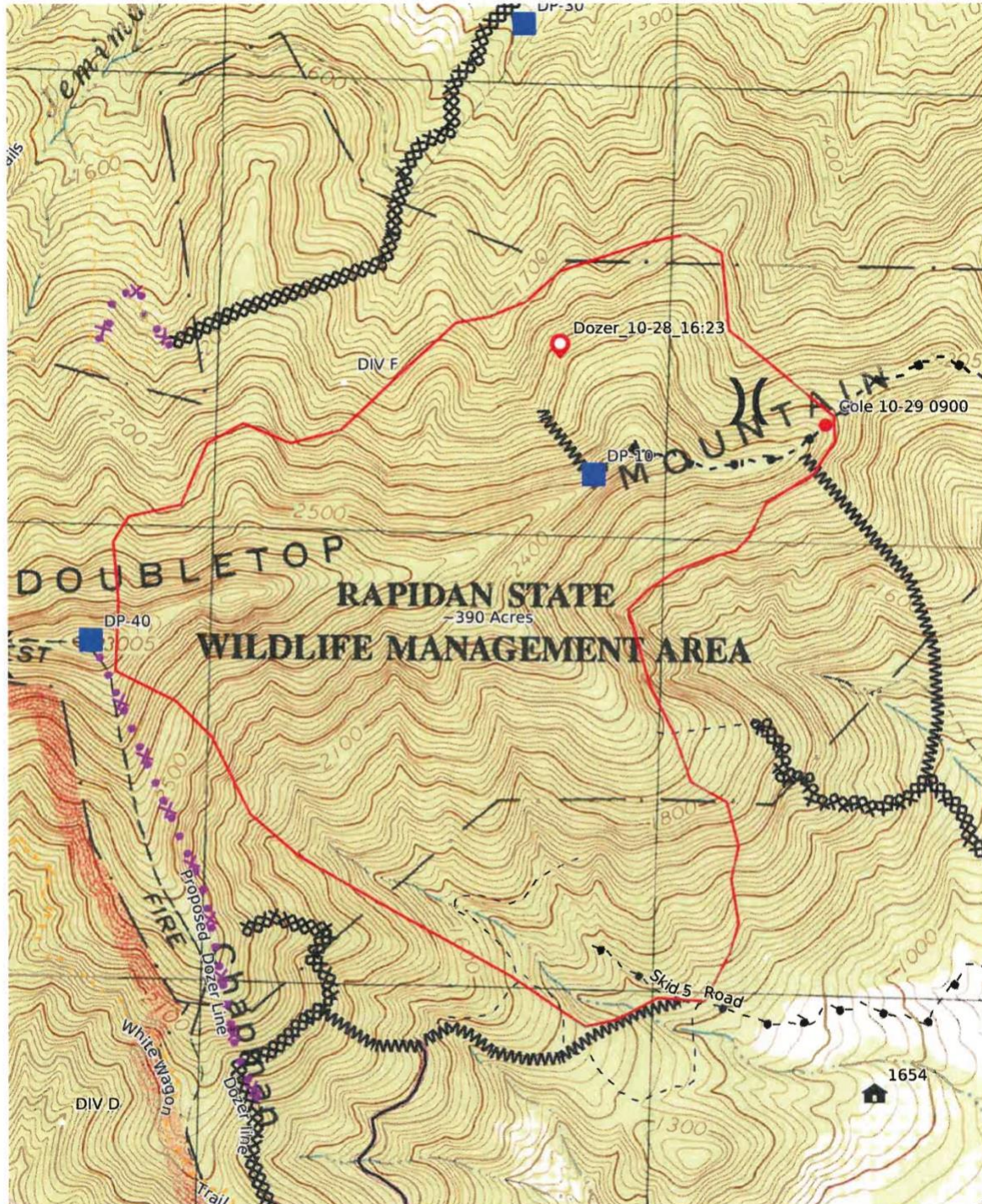
If dozer operators are brought in from other districts or regions, make sure they possess the proper training and competencies to work in the type of terrain of the fire they are being assigned to.

PHOTOS AND MAPS

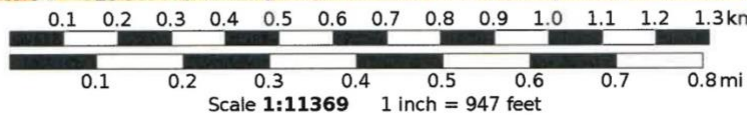
Map #1



Map #2



Mercator Projection
WGS84
UTM Zone 17S
CALTOPO



Map #3

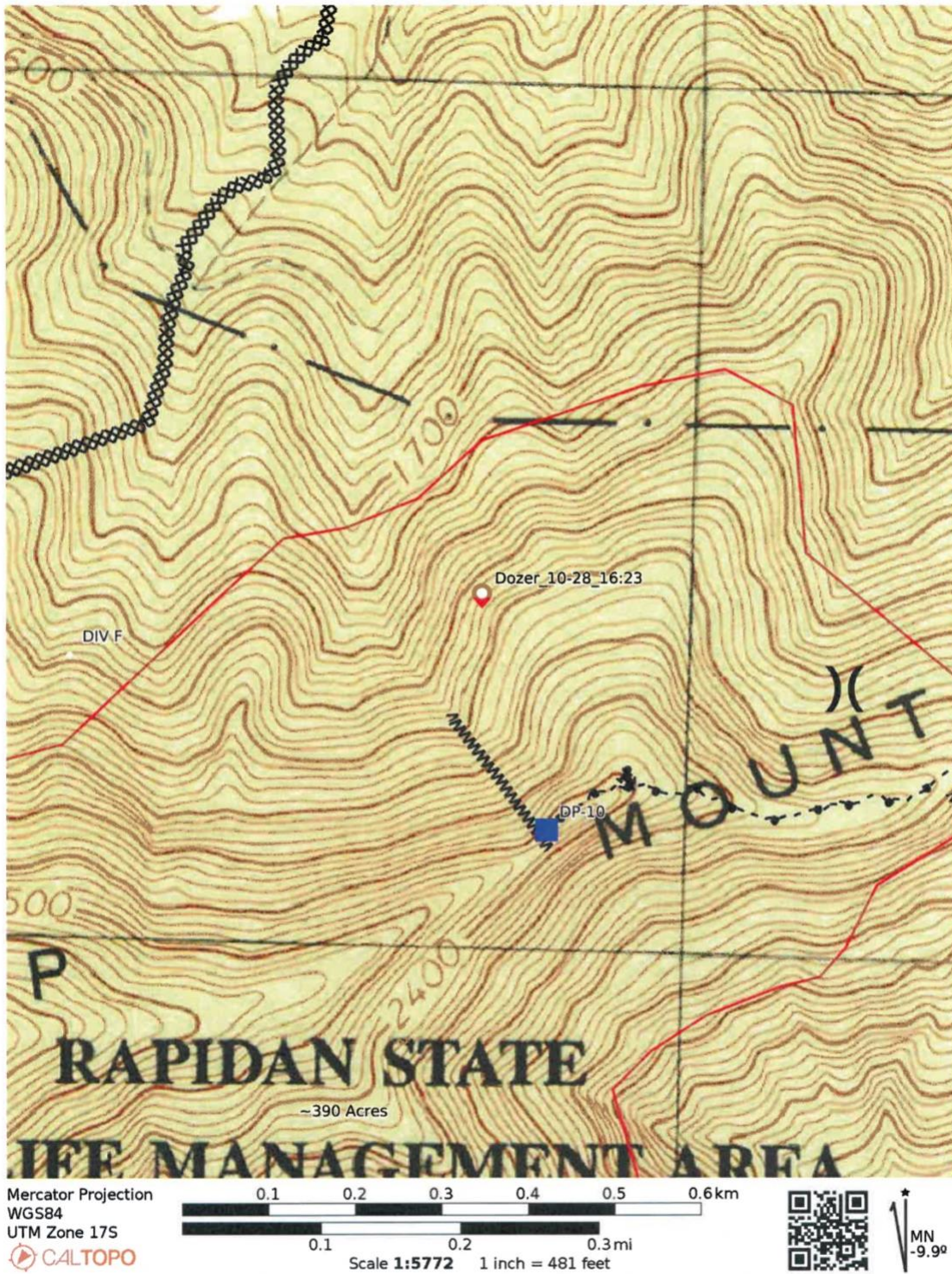


Photo #1 – View looking uphill from overturned dozer showing its line pushed downhill



Photo #2 – Shows red pin flags and dozer's right tract marks heading towards "the rock"



Photo #3 – View of “the rock” that cracked and caused the dozer to roll.



Photo #4 – View of “the rock” that cracked and caused the dozer to roll.



Photo #5 – View of “the rock” that cracked and caused the dozer to roll.



Photo #6 – View of “the rock” that cracked and caused the dozer to roll.



Photo #7 – View of “the rock” that cracked and caused the dozer to roll.



Photo #8 – Dozer final resting spot with views from several angles.



Photo #9 – Dozer final resting spot with views from several angles.



Photo #10 – Dozer final resting spot with views from several angles.



Photo #11 – Dozer final resting spot with views from several angles.



Photo #12 – Dozer final resting spot with views from several angles.



Photo #13 – Dozer final resting spot with views from several angles. Note loose items in the cab that can become projectiles in a rollover situation.

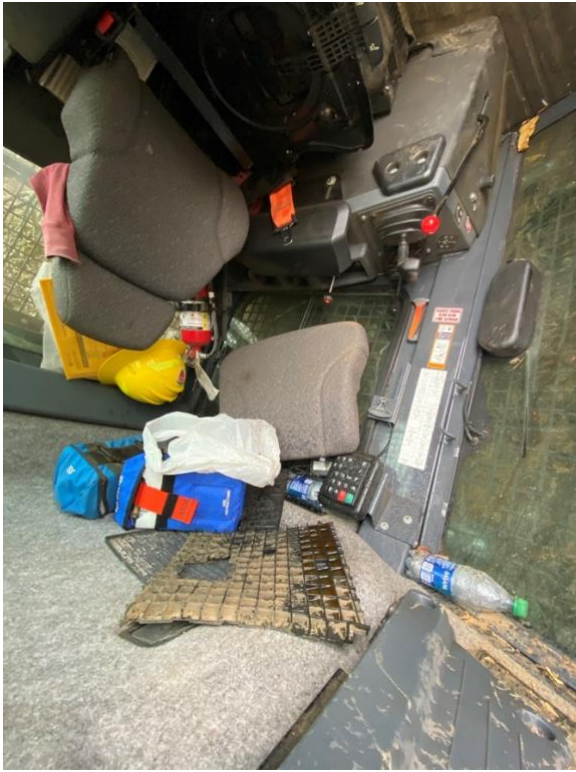


Photo #14 –

