



**FEDERAL ENERGY REGULATORY COMMISSION
HDD MONITORING PROGRAM
ROVER PIPELINE PROJECT
PROJECT DOCKET: CP15-93-000**

WEEKLY REPORT NO. 24:

REPORT PERIOD: Mar. 4, 2018 – Mar. 10, 2018

HDD MONITORING

At the request of the Federal Energy Regulatory Commission (FERC), representatives of J.D. Hair & Associates, Inc. (JDH&A) have visited select pipeline crossing sites on the Rover Pipeline Project that are currently under construction using horizontal directional drilling (HDD). The purpose of the site visits is to conduct random Spot Checks to document whether or not Rover is implementing the project-specific measures that FERC is requiring as part of the conditions to resume HDD operations. A list of the HDD crossings visited, the date, and summary comments are presented in the table below.

Date	HDD Crossing	Construction Stage	Summary Comments
03/04/18	East Austin Road	54-inch Back Ream	On the entry side of crossing the rig was continuing the 54-inch reaming pass. The driller informed Paul Jahraus (Barr Engineering Co.) that the reamer had spun off of the drill string and was potentially stuck in the hole. A fishing tool was being brought to the site to retrieve the reamer. The ROW monitoring log showed a minimum of three inspections per shift with no inadvertent returns observed. Drilling fluid additives located on site included ClayBreaker, DMD Lubra-Star Plus Lubricant, Halliburton Polyselect DMD Power PAC L, Halliburton Polyselect DMD Power XAN, Halliburton Polyselect DMD Soda Ash, Bara-Kade, E3Drilling Fluid Chemicals Ballbuster, and Super Gel-X Drilling Fluid. All of which are on approved materials sheet. Paul Jahraus arrived on exit side of crossing at approximately 15:24 and no crew was on site upon arrival. Documentation provided in spot check report SCAR030418-1.
03/04/18	Sandusky River	54-inch Back Ream	Paul Jahraus (Barr Engineering Co.) arrived on the entry side of the crossing at approximately 9:53. The crew was swabbing the hole, preparing for the 54-inch reaming pass. ROW monitoring logs showed a minimum of three inspections per shift and no inadvertent returns reported. Drilling fluid additives on site included BPM Minerals LLC Bara-Kade, which is on the approved list of additives. Paul Jahraus arrived on exit side of the crossing at approximately 10:19 where the crew was adding tail string. Documentation provided in spot check report SCSR030418-1.
03/04/18	Wolf Creek	30-inch Back Ream	Paul Jahraus (Barr Engineering Co.) arrived on the entry side of the crossing at approximately 9:15 and no crew was on site. ROW monitoring logs showed a minimum of three inspections per shift with no inadvertent returns observed. Drilling fluid additives on site included BPM Minerals LLC Bara-Kade, Halliburton Polyselect DMD Power Xan, and Halliburton Polyselect DMD Soda Ash, which were all on the approved list of additives. Paul Jahraus arrived on exit side of the crossing at approximately 9:34 where Crew was cleaning out lines. Documentation provided in spot check report SCWC030418-1.
03/04/18	Maumee River	60-inch Forward Ream	Paul Jahraus (Barr Engineering Co.) arrived on the entry side of the crossing at approximately 12:45. The rig had reamed 31 feet further, bringing the total distance reamed to 1,091feet. ROW monitoring logs for the entry side showed a minimum of three inspections per shift and no inadvertent returns were observed. Drilling fluid additives on site included DCS Fluid Solutions DCS SealPac HV, WEGO Chemical & Mineral Corp. Sandmaster Xanthan Gum, CETCO Super Gel-X, DCS Fluid Solutions Drilling Surfactant, and Western Clay Company Slikgel. All additives are on the approved additives list. Paul Jahraus arrived on the exit side of the crossing at approximately 12:35. The previous reamer had hit the100 hour mark, and the crew had pushed the it back out to install the new 60-inch reamer. Vacuum trucks were transporting drilling fluid back to entry side. Documentation provided in spot check report SCMR030418-1.



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03/04/18	SR-109/Turkeyfoot Creek	42-inch Forward Ream	When Paul Jahraus (Barr Engineering Co.) arrived on entry side of the crossing the mud pump was having issues and the crew was conducting maintenance and changing oil on equipment. ROW monitoring logs for the entry side of the crossing indicated that no inadvertent returns have been reported. Drilling fluid additives on site included DCS Fluid Solutions DCS SealPac HV, WEGO Chemical & Mineral Corp, Sandmaster Xanthan Gum, Halliburton Polyselect DMD Power Pac R, CETCO Super Gel-X, DCS Fluid Solutions ClayBreaker, and Western Clay Company Slikgel. All additives are on the approved additive list. On the exit side, the crew finished rigging up and projected to be reaming later that evening. Documentation provided in spot check report SC109030418-1.
03/05/18	Norfolk Railroad	56-inch Forward Ream	Paul Jahraus (Barr Engineering Co.) arrived on the entry side of the crossing at approximately 15:34. The entrance to rig site was underwater due to recent flooding. The crew was spreading gravel over submerged mats, attempting to create a new road to the site, and projected to continue reaming within 2 to 3 days. Paul could not view ROW monitoring log as road to drill cab is submerged. Drilling additives on site included BPM Minerals LLC Bara-Kade, which was on approved list of additives. Paul arrived on exit side of the crossing at approximately 15:49 and no crew were on site. Documentation provided in spot check report SCNR030518-1.
03/05/18	Interstate 77	60-inch Back Ream	Paul Jahraus (Barr Engineering Co.) arrived on the entry side of the crossing at approximately 13:04 where the rig was continuing with the 60-inch reaming pass and had approximately 8-9 joints remaining. They were projected to be completed with this reaming pass by early tomorrow morning. ROW monitoring logs for the entry side of the crossing showed a minimum of three inspections per shift with no inadvertent returns observed. Drilling fluid additives on site included BPM Minerals LLC Bara-Kade, Super Gel-X, E3 Ballbuster, Halliburton Polyselect DMD Power Pac L, Halliburton Polyselect DMD Power Xan, which are all on approved list of additives. Paul arrived on exit side of the crossing at approximately 12:56 to find the crew conducting maintenance on the mud pumps and checking sleeves. Documentation provided in spot check report SC77030518-1.
03/05/18	Tuscarawas River	30-inch Back Ream	<p>Paul Jahraus (Barr Engineering Co.) arrived on the entry side at approximately 10:40. The rig was shut down due to approximately 2 gallons of diesel fuel being spilled into cuttings pit. The contaminated material was being removed from the site. Paul Jahraus met with the HDD inspector (James), who provided the following information:</p> <ul style="list-style-type: none"> • Total footage reamed (30-inch diameter) was 3596 feet (72% complete) • Approximate station at the reamer 2221+27 • Depth below surface was 145 feet • Distance from the reamer to the western boundary of the wetland is approximately 1,355 feet (east) • Distance from the reamer to the Tuscarawas River was approximately 468 feet (east) • Mud pump rate that day was 0gal/min as rig was shut down • Full drilling fluid returns observed during the reaming process. <p>The ROW is continually monitored for inadvertent returns, and all drilling fluid additives onsite are approved for project use. Documentation provided in spot check report SCTR030518.</p>
03/05/18	Stream at 241	24-inch Forward Ream	Paul Jahraus (Barr Engineering Co.) arrived on the entry side of the crossing at 13:54 and was informed that the rig had twisted off on a joint of drill pipe yesterday approximately 30 feet into the bore. A new rig will be brought to the exit-side to push the drill string back out to the entry side, where they can reconnect the pipe to the rig. The new rig is expected to arrive later in the afternoon. The crew has 20 feet left to ream on the 24-inch pass and are projected to be finished with this pass later tonight. ROW monitoring logs for the entry side of the crossing showed a minimum of three inspections per shift with no new inadvertent returns observed. Drilling fluid additives on site included Western Clay Company Slikgel, Lost Circulation Specialists, Inc. Magma Fiber Fine, DCS Drilling Surfactant, DCS SealPac HV, and Super Gel-X, which are all on the approved list of additives. Paul arrived on exit side of the crossing where the crew was conducting maintenance, while waiting for the rig to arrive. Documentation provided in spot check report SC241030518-1.



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03/06/18	Tuscarawas River	30-inch Back Ream	<p>Paul Jahraus (Barr Engineering Co.) arrived on the entry side at approximately 11:22. The rig was still shut down due to approximately two gallons of diesel fuel being spilled into cuttings pit. The contaminated material was being removed from the site by Badger vacuum trucks and transported to a proper location as a precautionary measure. The diesel did not impact drilling fluids and was not pumped downhole. The contaminated material was disposed of and the drilling fluid was replaced. The crew projects that reaming will continue later in the day. Paul met with the HDD inspector (James), who confirmed that total footage reamed, approximate station of reamer, depth, distance from western wetland boundary, distance to Tuscarawas River, mud pump rate, and drilling fluid returns were unchanged from the previous day as no further reaming had taken place.</p> <ul style="list-style-type: none"> • Total footage reamed (30-inch diameter) was 3596 feet (72% complete) • Approximate station at the reamer 2221+27 • Depth below surface was 145 feet • Distance from the reamer to the western boundary of the wetland is approximately 1,355 feet (east) • Distance from the reamer to the Tuscarawas River was approximately 468 feet (east) • Mud pump rate that day was 0gal/min as rig was shut down • Full drilling fluid returns observed during the reaming process. <p>Documentation provided in spot check report SCTR030618.</p>
03/07/18	East Austin Road	54-inch Back Ream	<p>Paul Jahraus (Barr Engineering Co.) arrived on entry side of crossing at approximately 15:25 and found the crew welding straps. The reamer was retrieved last night and a 42-inch barrel was being installed to centralize the reamer before tripping back in to finish the pass. No ROW inspection walks had been done for the shift, as the rig had not been reaming. Approved drilling fluid additives located on site included ClayBreaker, DMD Lubra-Star Plus Lubricant, Halliburton Polyselect DMD Power PAC L, Halliburton Polyselect DMD Power XAN, Halliburton Polyselect DMD Soda Ash, Bara-Kade, E3Drilling Fluid Chemicals Ballbuster, and Super Gel-X Drilling Fluid. Paul arrived on exit side of crossing at approximately 15:46 and the crew was waiting for the entry side to begin reaming again. Documentation provided in spot check report SCAR030718-1.</p>
03/07/18	Tuscarawas River	30-inch Back Ream	<p>Paul Jahraus (Barr Engineering Co.) arrived on the entry side of the crossing and was informed that the rig had lost returns 2 feet before completing joint number 127. This is approximately the same location that circulation was lost during the pilot hole. The crew immediately stopped reaming and pumped a 2,000-gallon pill of Super Swell and Diamond Seal before tripping out. A full ROW monitoring walk and drone flyover was completed with no visible inadvertent returns. The crew plans to trip back in tomorrow to try reaming again. Paul met with the HDD inspector (James), who provided the following information:</p> <ul style="list-style-type: none"> • Total footage reamed (30-inch diameter) was 3,939 feet (79% complete) • Approximate station at the reamer 2217+85' • Depth below surface was approximately 135 feet • Reamer is already past the western boundary of the wetland by approximately 1,698 feet • Reamer is already past the Tuscarawas River by approximately 796 feet • Mud pump rate was approximately 650gal/min • Approximately 1000 gallons of drilling fluid was lost for the shift. (Amount required to fill the drill string) <p>Documentation provided in spot check report SCTR030718.</p>



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03/08/18	Tuscarawas River	30-inch Back Ream	<p>Paul Jahraus (Barr Engineering Co.) arrived on the entry side at approximately 10:43 where the rig was tripping back in to where they stopped on the 30-inch reaming pass. Paul Jahraus met with HDD inspector (James) and discussed the rig's progress and activities since last spot check. No information on reamer's footage, location, etc. had changed from yesterday as no more reaming had taken place.</p> <ul style="list-style-type: none"> • Total footage reamed (30-inch diameter) was 3,939 feet (79% complete) • Approximate station at the reamer 2217+85' • Depth below surface was approximately 135 feet • Reamer is already past the western boundary of the wetland by approximately 1,698 feet • Reamer is already past the Tuscarawas River by approximately 796 feet • Mud pump rate was approximately 0 gal/min • No drilling fluid was lost for the shift. <p>Documentation provided in spot check report SCTR030818.</p>
03/08/18	Highway 50	42-inch Forward Ream	<p>Paul Jahraus (Barr Engineering Co.) arrived on entry side of crossing where the crew was continuing 42-inch reaming pass. The total footage reamed was 1,300 feet with the rig currently on joint number 42 out of 84. The pump rate was approximately 500 gpm and they had been receiving full returns until joint number 42. Cuttings were piling up behind the reamer blocking the flow of drilling fluid, so they tripped out to change the jets on the reamer. The plan is to increase the pump rate to 600 gpm for the remainder of the reaming pass to better move the cuttings from the bore. Drilling fluid additives on site included Super Gel-X, Halliburton Polyselect Power Pac R, Halliburton Polyselect DMD Soda Ash, and Bara-Kade, which are all on the approved additive list. ROW monitoring logs for the entry side showed a minimum of three inspections per shift with no new inadvertent returns observed. Paul arrived at exit site at approximately 16:05 where the crew was waiting for the rig on entry side to trip back in and begin reaming. Documentation provided in spot check report SC50030818-1.</p>
03/08/18	Private Roads & Middle Island Creek	36-inch Back Ream	<p>Paul Jahraus (Barr Engineering Co.) arrived on entry side of crossing at approximately 14:39. An excavator was applying tension on the tail string to aid in the reaming process. The rig was currently on joint 19 with an approximate station of 759+80'. The pump rate was 366 gpm and they were receiving full returns at the containment pit. The ROW monitoring logs on the exit side showed no inadvertent returns with a minimum of three inspections per shift. Drilling fluid additives on site included Super Gel-X, E3 Drilling Fluid Chemicals BallBuster, and Western Clay Company Slikgel, which are all on the approved list of additives. Paul arrived on exit side at approximately 16:34 where the crew was continuing with 36-inch reaming pass. Documentation provided in spot check report SCMIC030818-1.</p>
03/08/18	Ohio River	24-inch Forward Ream	<p>Paul Jahraus (Barr Engineering Co.) arrived on entry side of the crossing where the rig was continuing the 24-inch reaming pass on joint number 60. The total footage reamed was approximately 1,858 feet (Station 652+11'), with a current depth of 139 feet. The mud pump rate was 311 gpm with full returns to the containment pit. ROW monitoring logs for the entry side of the crossing showed a minimum of three inspections per shift with no new inadvertent returns observed. Drilling fluid additives on site included Super Gel-X, Halliburton Polyselect Power Pac R, and E3 Drilling Fluid Chemicals BallBuster. All additives on site are on the approved list of additives. Paul arrived on exit side at approximately 18:36 and the crew was leaving the site for the day after breaking down the tail string. Documentation provided in spot check report SCOR030818-1.</p>



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03/09/18	Tuscarawas River	30-inch Back Ream	<p>Paul Jahraus (Barr Engineering Co.) arrived on the entry side at approximately 12:40 where the rig was continuing the reaming pass. Paul met with the HDD inspector (James), who provided the following information:</p> <ul style="list-style-type: none"> • Total footage reamed (30-inch diameter) was 4,125 feet (82% complete) • Approximate station at the reamer 2215+99' • Depth below surface was approximately 120.5 feet • Reamer is past the western boundary of the wetland by approximately 1,884 feet • Reamer is past the Tuscarawas River by approximately 982 feet • Mud pump rate was approximately 700gal/min • Full drilling fluid returns were being maintained on exit side <p>The ROW is continually monitored for inadvertent returns, and all drilling fluid additives onsite are approved for project use. Documentation provided in spot check report SCTR030918.</p>
03/09/18	Interstate 77	54-inch Swab Pass	<p>Paul Jahraus (Barr Engineering Co.) arrived on the entry side of the crossing and was informed that the drill stem broke off at the reamer, which was three joints from rig, while on the third 54-inch reaming pass. The rig was at 1,620 feet of the total 1,689 feet. An excavator was digging up the area at the mouth of the borehole, and the crew was not sure of the next steps that would be taken. The HDD inspector stated that a swab pass may be done and projected that the rig would begin pullback on Sunday or Monday. The ROW monitoring logs for the entry side of the crossing showed a minimum of three inspections per shift with no inadvertent returns observed. Paul arrived on exit side of the crossing where the crew was inactive due to drill stem breaking off. Drilling fluid additives on site included BPM Minerals LLC Bara-Kade, Super Gel-X, E3 Ballbuster, Halliburton Polyselect DMD Power Pac L, and Halliburton Polyselect DMD Power Xan, which are all on approved list of additives. Documentation provided in spot check report SC77030918-1.</p>
03/10/18	Norfolk Railroad	56-inch Forward Ream/ Fishing	<p>Paul Jahraus (Barr Engineering) arrived on the entry side of the crossing and found that a new access road had been created. The crew was tripping a fishing tool downhole to retrieve a barrel that had twisted off and was four joints along so far. The rig had been reaming with a 56-inch reamer and had progressed along 1,220 feet. ROW monitoring logs for the entry side of the crossing showed no inadvertent returns. Drilling fluid additives on site included BPM Minerals LLC Bara-Kade, which was on approved list of additives. A third-party inspector was present onsite. Paul arrived on exit side of the crossing at approximately 13:57 where the crew was waiting for the fishing tool to get back on bottom. Documentation provided in spot check report SCNR031018-1.</p>
03/10/18	Stream at 241	36-inch Back Ream	<p>Paul Jahraus (Barr Engineering Co.) arrived on the entry side of the crossing at approximately 12:38 to find the crew cleaning out mud pumps. The rig was currently pull reaming with a 36-inch reamer. The reamer was at a distance of 220 feet so far for the pass (station 2799+40') and at a depth of approximately 25 feet. The mud pump rate was 300 gpm and the rig had been receiving full returns until the hole flush yesterday. The crew shut down immediately when mud flushed back to entry side and overfilled the containment pit. Approximately 50 gallons of drilling fluid overflowed into an upland area, but no resources were affected. The contaminated material was sucked up with a vacuum truck and removed. The containment pit was being enlarged today. ROW monitoring logs for the entry side of the crossing showed a minimum of three inspections per shift with no new inadvertent returns observed. Drilling fluid additives on site included Western Clay Company Slikgel, Lost Circulation Specialists, Inc. Magma Fiber Fine, DCS Drilling Surfactant, DCS SealPac HV, and Super Gel-X, which were all on the approved list of additives. Documentation provided in spot check report SC241031018-1.</p>



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03/10/18	Tuscarawas River	30-inch Back Ream	<p>Paul Jahraus (Barr Engineering Co.) arrived on the entry side and the rig was shut down so that crew could replace the fuel injectors on the mud pump engine. Paul met with the HDD inspector (James), who provided the following information:</p> <ul style="list-style-type: none">• Total footage reamed (30-inch diameter) was 4,433 feet (89% complete)• Approximate station at the reamer 2212+91'• Depth below surface was approximately 77.3 feet• Reamer is past the western boundary of the wetland by approximately 2192 feet• Reamer is past the Tuscarawas River by approximately 1290 feet• Mud pump rate was approximately 700gal/min• Full drilling fluid returns were being maintained on exit side. <p>The ROW is continually monitored for inadvertent returns, and all drilling fluid additives onsite are approved for project use. Documentation provided in spot check report SCTR031018.</p>