

**REPORT OF INDUSTRIAL STORMWATER
COMPLIANCE EVALUATION INSPECTION**

AT

**U.S. Army Garrison, Fort Leonard Wood,
8112 Nebraska Avenue, Building 11400
Fort Leonard Wood, MO 65473
NPDES NO: MO-0117251**

July 12-13, 2023

**by U. S. ENVIRONMENTAL PROTECTION AGENCY
Region 7: Enforcement and Compliance Assurance Division**

INTRODUCTION

I performed a Compliance Evaluation Inspection at Fort Leonard Wood in Missouri on July 12, 2023. The inspection was authorized by Section 308(a) of the Federal Water Pollution Control Act, as amended. I conducted this inspection following the procedures described here and followed applicable EPA Region 7 Standard Operating Procedures. This narrative report presents the findings of the inspection.

PARTICIPANTS

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INSPECTION PROCEDURES

I, Caitlin Dix, EPA Region 7 Lead Inspector, arrived at Fort Leonard Wood (the “site” or “facility”), located at 8112 Nebraska Avenue, Building 11400, Fort Leonard Wood, MO 65473, at 9:00 a.m. (CT) on July 12, 2023 for an announced inspection. I presented credentials to Shannon Cain and informed him that this was an EPA Region 7 inspection to determine compliance as authorized by Clean Water Act Section 308 and implementing regulations. This report is based on information supplied by Fort Leonard Wood representatives, direct observations made by the EPA Region 7 inspector, records and reports maintained by the permittee and other information including: photographs taken by EPA Region 7 inspector(s), physical evidence collected by the EPA Region 7 inspector(s), measurements taken by EPA Region 7 inspector(s), verbal or written statements made by information supplied by Fort Leonard Wood representatives during or after the on-site inspection, and materials, processes, data, photographs, or documents shown, demonstrated, or submitted to the EPA Region 7 inspector(s) by Fort Leonard Wood representatives during or subsequent to the on-site inspection. In addition, information gathered prior to or after the inspection from a review of EPA, State, and/or public records may be included in this report.

Before the inspection, I reviewed facility background information including existing permits, information on the receiving stream, compliance and enforcement history, facility website, maps, and aerial images.

I met with Environmental Division staff at the Directorate of Public Works for Fort Leonard Wood. Kim Snouffer is lead for the industrial stormwater permit with program oversight by Shannon Cain, Stormwater Program Manager. I told Directorate of Public Works Environmental Division staff that the inspection would be a review of required records, their Stormwater Pollution Prevention Plan (SWPPP), and a visual inspection of one of the industrial facilities covered by their industrial stormwater permit.

The industrial stormwater permit covers approximately 47 facilities discharging to 12 outfalls. Given the large number of facilities, EPA evaluated the list of facilities and selected the Central Vehicle Wash facility as a sample facility to evaluate for this inspection. This inspection was non-comprehensive and although the inspection was announced, which facilities were going to be inspected was not announced. Fort Leonard Wood Directorate of Public Works Environmental Division staff coordinated with onsite personnel where available.

Naji Ahmad provided the Confidential Business Information (CBI) Notice for information collected during the inspection during the opening conference. Fort Leonard Wood did not make any confidentiality claims.

I completed the visual inspection on July 12, 2023. I documented my findings and observations by taking photographs and taking notes.

I summarized the findings of the visual inspection with Directorate of Public Works Environmental Division during the closing conference of the inspection on July 13, 2023. I issued a Notice of Preliminary Findings (NOPF) on July 13, 2023 (attachment #2.)

FACILITY DESCRIPTION

Facility Location

Fort Leonard Wood is in the south-central Missouri Ozarks and covers more than 61,410 acres mostly in Pulaski County, Missouri. Fort Leonard Wood operates a Municipal Separate Storm Sewer System (NPDES permit ID# MO-R040088). Surface water drainage within Fort Leonard Wood is through small ephemeral streams influenced by a topographic ridge dividing the eastern and western sections of the installation. Drainage systems on the eastern section discharge to the Big Piney River, a perennial stream. The western section discharges to Roubidoux Creek with several losing sections. Both the Big Piney River and Roubidoux Creek flow north to join with the Gasconade River.

This inspection focused on the Central Vehicle Wash Facility. The Central Vehicle Wash Facility discharges to Outfall 028. Outfall 028 discharge flows to Big Piney River.

Facility Operations

Fort Leonard Wood is a United States Army installation (SIC Code 9711). Fort Leonard Wood and the Maneuver Support Center of Excellence has diverse missions and select trainings to include the Non-Commissioned Officers Academy, US Army Engineer School and Brigade, The US Army Military Police School and Brigade, the Army Chemical, Biological, Radiological, and Nuclear School and Brigade, and has a large basic combat training mission. All Department of Defense training for earth moving, motor transportation, civil support and chemical, biological, radiological and nuclear first responder happens at Fort Leonard Wood. The installation trains nearly 80,000 military and civilians each year.

Various industrial activities occur at Fort Leonard Wood in support of the mission. The Stormwater Pollution Prevention Team evaluated industrial activities, as defined by the National Pollutant Discharge Elimination System (NPDES), at Fort Leonard Wood for stormwater exposure. The industrial stormwater permit covers approximately 47 facilities with 12 outfalls (Outfalls #007, #012, #014, #015, #019, #024, #025, #026, #027, #028, #030, and #031). This compliance evaluation inspection focused on a single facility covered under the industrial stormwater permit. This inspection focused on the Central Vehicle Wash Facility. The Central Vehicle Wash Facility discharges to Outfall 028.

The Central Vehicle Wash Facility operates using a water recycling system. The Central Vehicle Wash Facility includes two settlement basins, an equalization basin, two sand filters, a finish water supply basin, a control building, vehicle wash stations, and a tracked vehicle bath. Water can be discharged to the environment through the stormwater bypass and two water basin emergency overflows. Fort Leonard Wood says discharges through the stormwater bypass

contain only stormwater runoff from the hardstand. Fort Leonard Wood says the stormwater bypass is only used after wash hours when the facility is clean. The basin water is processed through an oil skimmer and sedimentation prior to discharge to the equalization basin. The facility is designed so normal washing operations should not result in basin overflows to the environment. Sedimentation basins and an oil skimmer treat flows from the central vehicle wash facility. Stormwater from the vehicle wash facility combine in an extended retention basin with flows from mobile refueler containment parking. An oil/water separator treats flows from the mobile refueler containment parking. Flows from the extended retention basin discharge to Outfall 028. Legal Description: SW¼, NE¼, Sec.27, T35N, R11W, Pulaski County UTM Coordinates: X = 577276, Y = 4176660 Receiving Stream: Tributary to Big Piney River First Classified Stream and ID: 100K Extent-Remaining Stream (C) (3960) USGS Basin & Sub-watershed No.: 10290202-0403 Maximum Flow: 22.93 million gallon per day.

Associated pollutants from the Central Vehicle Wash Facility include total suspended solids, oil and grease, metals and benzene.

Regulatory History

The Missouri Department of Natural Resources authorized the discharge of industrial stormwater from the site under Missouri State Operating Permit MO-0117251. Fort Leonard Wood has a site-specific permit effective July 1, 2022 and expiring June 30, 2027. The permit authorizes only stormwater discharges under the Missouri Clean Water Law and the National Pollutant Discharge Elimination System; the permit does not apply to other regulated areas.

Neither the Missouri Department of Natural Resources nor EPA has inspected this industrial stormwater permit within the last five years.

Effluent charts for July 2018 to July 2023 available via the Enforcement and Compliance History Online show exceedance violations for pH and oil and grease. During that time, there were effluent exceedances at Outfall #006, #012, #015, #018, #022, #024, #025, #027, and #028. The Effluent Limit Exceedance Report shows exceedances for pH at Outfall 028 on June 30, 2020.

FINDINGS AND OBSERVATIONS

I noted the following observations during the visual inspection and record review. The weather conditions at the time of the inspection were sunny (79°-91°F). The most recent rain event was approximately 0.60 inches on July 02, 2023, using the High Plains Regional Climate Center CLIMOD website.

Fort Leonard Wood constructed the Central Vehicle Wash Facility as a centralized wash rack for vehicle washing.

Sergeant Adam Johnson, training management (land), provided a tour and site operation overview of the Central Vehicle Wash Facility. Sergeant Johnson provides leadership over the Central Vehicle Wash by putting in service requests and overseeing key checkout. There is an

operation checklist and maintenance manual in the operation booth. Keys are signed out to access the operation booth. There is limited training as most information needed is in the operation manual. Only military vehicles are washed at the Central Vehicle Wash Facility and there is no washing of personal vehicles. Military vehicles are washed after a field cycle, before a parade, or to get vehicles inspection ready. The facility is currently used about once or twice a week. (Photo #8 -#13)

Wash station islands throughout the facility provide drive up locations for vehicle washing. Photo #15 shows an example wash station island at the Central Vehicle Wash Facility. The wash station has signage prohibiting the use of soaps, detergents and solvents, and signage warning that water is non-potable and not safe to drink. There is a yellow overpack salvage drum near the wash racks filled with materials for containment and cleanup of fuels and oils (Photo #16).

A concrete berm or curb surrounds the wash facility at the Central Vehicle Wash Facility (Photo #17). Wash water from vehicle washing is contained and directed to treatment. Trench drains collect wash water from wash stations at the Central Vehicle Wash Facility (Photo #20). Trench drains capture and contain wash water at the vehicle entrances for the Central Vehicle Wash Facility (Photo #18).

There is a below grade bath for continuous track vehicles (Photo #21 -22). The bath has rumble strips to knock off debris from continuous tracks. The tracked vehicle bath is not often used for continuous track vehicles but is regularly used by for other military vehicles because the water cannons provide good pressure.

Wash water from the wash stations and the tracked vehicle bath drains to sediment collection basins south of the operation booth at the Central Vehicle Wash facility. The sediment collection basin has an oil water separator. The oil skimmer collects oils into a used oil collection tank. (Photo #26) There is a stormwater overflow valve and step one of vehicle wash is to make sure the stormwater overflow valve is closed. There are two manual cranks for sluice gates at the sediment basins (Photo #14). Stormwater bypass sluice gate (MSG-3) must be closed during Central Vehicle Wash Facility operations. Washing operation sluice gate (MSG-4) must be open during Central Vehicle Wash Facility operations. When the stormwater overflow valve is open the discharge flows to the constructed wetland.

The sediment basin was cleaned last year. The basin was drained, sediment was removed, and sediment was dewatered on the wash rack. Sediment was sampled for gasoline range organics and diesel range organics. Based on results the sediment was disposed of at the landfill.

Float-control pumps move water from the sediment collection basin to the equalization basin (Photo #23). Pretreated water is held in the equalization basin and dosed to the sand filters for further treatment (Photo #19). From the sand filters, treated water flows to a "finish water" basin in the northeast area of the Central Vehicle Wash Facility. This water has flowed through the treatment process and is used for vehicle washing. There is an emergency overflow outlet at the east side of the basin that discharges to the constructed wetland. (Photo #25) There is sparse vegetation, including a dead tree approximately two to three years old, around the berms of the treatment basins. I asked how often someone inspects the berm. Kim Snouffer

said the berm and vegetation would be inspected maybe once or twice a year as part of a maintenance inspection.

The equalization basins overflow through riprap into a vegetated forebay to a constructed wetland. Overflow may also be used for emergency bypass or overflow from the finish water basin and treatment basin. I saw several small trees growing in the riprap. Trees species and location, like eastern red cedar growing in the riprap overflow, suggest the trees were not planted as part of the original design and installation. Kim Snouffer said a landscape engineer is required for the design, installation and maintenance of the emergency bypass. They must contract a specialized contractor for maintenance of the emergency bypass and forebay. Shannon Cain said money may not always be available for maintenance activities. (Photos #6-#7)

I saw vegetation that looked like *Sericea lespedeza* (Photo #7) growing around the emergency bypass, forebay, and constructed wetland.

The 4-acre constructed wetland collects runoff from the Central Vehicle Wash Facility to the west and motor pool to the northeast. The wetland was constructed with an impermeable liner, specified soil amendments, and vegetation plantings. There is a concrete outlet structure with a trash rack on top of the overflow discharge and a metered discharge at the bottom. There is not a written maintenance plan. Maintenance is directed by Environmental Division. The Environmental Division triggers maintenance through a service request and the work order is typically completed in 30 days. The facility is newly constructed and not much maintenance has occurred since construction. (Photos #4 - #5)

Mowed grass buffers the constructed wetland. Mowed grass is currently brown with severe drought currently impacting the area. Vegetation in the wetland appeared healthy. Vegetation in the constructed wetland is dominated by cattails (*Typha*) with reed (*Juncus*) and a few small trees. I also saw sedges (*Carex*) and pickerel weed (*Pontederia*). Cattails may be considered invasive vegetation to a constructed wetland depending on the vegetation management plan. A vegetation management concern can include an increase in the numbers of aggressive nuisance species, like cattails. The decision to remove aggressive species like cattails depends on the site-specific objectives and original design specifications. A landscape plan or species composition and plant density objectives were not provided or not available. An operation and maintenance plan for the constructed wetland and appurtenances was not provided or not available.

Fort Leonard Wood contracts with the U.S. Army Corps of Engineers for stormwater sampling. The outfall is inspected monthly and sampled twice a year. Fort Leonard Wood recently cleared woody vegetation from the outfall as part of their maintenance program. Woody vegetation is removed as needed and based on service requests. (Photos 1-3)

The Stormwater Pollution Prevention Plan attachment with outfall sampling summaries shows an exceedance for pH on February 24, 2020, and a water quality concern is highlighted for the April 12, 2020 sample with aluminum measuring 1100 µg/L. The Industrial Stormwater Corrective Action Log in the SWPPP appendix provides a comment "acid rain" for the February

24, 2020, sample date. There is no comment for the highlighted water quality concern of 1100 µg/L of aluminum. Also in the corrective action log is an illicit discharge on March 2, 2022, at outfall 028 of sheen & diesel odor in the wetland forebay. Corrective action of cleaning is documented and the source was unknown.

I saw small rocks on the ground throughout the wash rack and in the trench drains. Kim Snouffer says rocks brought in by the vehicles being washed are swept up periodically as part of their maintenance program. (Photo #20)

There was a notable amount of goose feces on the ground around the pretreatment area and throughout much of the Central Vehicle Wash facility. I was told the accumulation of geese feces was recent and the area is occasionally swept as part of housekeeping. (Photo #26-27)

Stormwater Pollution Prevention Plan

The NPDES permit requires the facility to develop and implement a Stormwater Pollution Prevention Plan. Fort Leonard Wood prepared a SWPPP dated January 2023 for Permit # MO-0117251. I reviewed the SWPPP for industrial activities at Fort Leonard Wood for completeness. Overall, the SWPPP appeared up-to-date and comprehensive; the plan was satisfactory, though as a living document there can always be improvements and updates.

The SWPPP has a certification statement signed by Shannon M. Cain, Interim Chief, Compliance Branch and Stormwater Program Manager. The stormwater pollution prevention team responsibilities are described, and the team includes the:

- Stormwater Program Manager
- Stormwater Specialist
- Chief, DPW Compliance Branch
- Chief, DPW Environmental Division

The SWPPP outlines the potential pollutants associated with each industrial activity type, lists specific contaminants for industrial activities, and provides a narrative explaining how best management practices (BMPs) are implemented to control and minimize contaminants potentially entering stormwater.

The site map marks outfalls and shows major structural controls like wet detention ponds, rain gardens, and constructed wetlands. The SWPPP identifies the regulated Municipal Separate Storm Sewer System.

The SWPPP provides a schedule for monthly site inspections and template inspection forms. The provided SWPPP did not include inspection records as part of the attachments. The Environmental Division maintains inspection records for the Central Vehicle Wash Facility and structural controls like the constructed wetlands.

Facilities with industrial activities have a designated Environmental Compliance

Officer who must attend annual environmental trainings given by the Directorate of Public Works Environmental Division. The provided SWPPP did not include training records as part of the attachments.

Fort Leonard Wood provided attachments to the January 2023 Stormwater Pollution Prevention Plan which includes:

- General location map,
- Industrial activity area map,
- Sampling data summaries,
- Stormwater Best Management Practice Manual for Fort Leonard Wood,
- QAPPP Sampling Design and Rationale,
- Industrial Stormwater Outfall Inspection Form,
- Industrial Stormwater Facility Inspection Form,
- Industrial Stormwater Structural Best Management Practice Inspection Form,
- Fort Leonard Wood Threatened and Endangered Species,
- Fort Leonard Wood Historic Properties,
- Industrial Stormwater Illicit Discharge Report Form,
- Impromptu Site Assistance Visit Form and Environmental Observation Form,
- Effluent Monitoring Corrective Action Form and Log, and
- Abbreviations and Acronyms.

“Inspection of Structural Stormwater BMPs at Industrial Facilities” provides a checklist for the constructed wetland basin that includes:

- Inlet free of erosion, damage, debris, excess sediment/vegetation,
- Outlet free of erosion, damage, debris, excess sediment/vegetation,
- Forebays free of debris or excess vegetation,
- Forebay sediment below clean-out level of 50%,
- Micropool area free of debris,
- Micropool total sediment below clean-out level,
- Embankment intact, no erosion,
- Riprap in place,
- Evidence of damage from wildlife (beavers, geese, etc.), and
- Sheen present on water.

A threshold for what is considered excess vegetation is not provided. Design specifications that govern sediment cleanout thresholds and vegetation management were either not available or not provided.

Other Observations

The manual opening and closing of sluice gates to make sure wash water is discharged to the entire treatment system and not directly to the stormwater bypass and the constructed wetland is a critical control point. This critical control point is dependent on proper operation by staff known to turnover every couple of years.

Overall, Fort Leonard Wood appeared to have a good stormwater program with experienced and knowledgeable staff leading.

CONCLUSION

I summarized the findings of the visual inspection with Directorate of Public Works Environmental Division during the closing conference of the inspection on July 13, 2023. I issued a Notice of Preliminary Findings on July 13, 2023 (attachment #2).

The following findings were identified during the inspection and are included on the NOPF:

- 1) Inadequate operation and maintenance for construction wetland, forebay, and emergency overflows (Permit section §B and §C.7.)

A response to the NOPF was sent by Shannon Cain on July 25, 2023. Fort Leonard Wood said they are working to add a maintenance schedule to the Base Maintenance Contract to perform a cleaning/clearing of the wetland, forebay, and overflows every three years. Fort Leonard Wood is developing a maintenance schedule for the wetland pond which consists of the removal of cattails, trees, and unwanted vegetative species to be conducted every three years by an approved contractor. If an inspection reveals maintenance is required before the three-year scheduled maintenance, Fort Leonard Wood will initiate a work order to resolve the issue. Fort Leonard Wood says sediment will be removed once the wetland reaches 75 percent capacity. Fort Leonard Wood removed the trees in the rock spillway and the rock spillway will be on a three-year maintenance schedule.

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Caitlin Dix
Physical Scientist, ECAD/WB

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ATTACHMENTS:

1. Photo Log (15 pages)
2. NOPF (1 pages)
3. Stormwater Pollution Prevention Plan (21 pages)
4. Stormwater Pollution Prevention Plan Attachments (58 pages)
5. Missouri State Operating Permit (67 pages)
6. NOPF Responses (11 pages)