

U.S. EPA STATEMENT OF BASIS

for

Class III Permit Modification

at

**U.S. Army Garrison - Fort McCoy
Sparta, Wisconsin**

WI3 210 020 563

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
STATEMENT OF BASIS
June 2018

CLASS III PERMIT MODIFICATION
U.S. ARMY GARRISON - FORT McCOY
SPARTA, WISCONSIN
WI3 210 020 563

I. INTRODUCTION

In June 1990, the United States Environmental Protection Agency (EPA) and the Wisconsin Department of Natural Resources (WDNR) issued a joint Resource Conservation and Recovery Act (RCRA) Permit to the facility known as U.S. Army Garrison-Fort McCoy (hereafter referred to as FM, the facility or installation) for storage of hazardous waste in containers as specified in the U.S. Code of Federal Regulations (CFR) at 40 CFR Part 264, Subpart I. The federal portion of this permit required the facility to perform a RCRA Facility Investigation (RFI) and, if indicated, perform corrective measures at 11 Solid Waste Management Units (SWMUs). During the RFI, 4 additional SWMUs were identified and added to the RFI. The federal permit was modified twice (in September 1997 and in August 2001) to require corrective measures activities at a total of six SWMUs (six SWMUs from both the 1997 and 2001 modifications). The September 1997 modification also ended corrective action requirements at five of the originally identified 11 SWMUs and the 4 additional SWMUs which had been later added. (Please see Table 1 below for specific SWMU information.)

Corrective action has been conducted under the RCRA permit, and all SWMUs have met the permit requirements for closure either through remediation (contaminant concentrations below media cleanup standards as well as at or below maximum contaminant levels) or institutional controls that would prevent potential future exposure to receptor populations. This Statement of Basis (SB) for FM explains the EPA determination of Corrective Action Complete at the facility and therefore serves as a Class III Permit Modification to terminate corrective action activities at FM. For the Class III Permit Modification, the permittee must: 1) submit a modification request to the Director; 2) hold a public meeting no earlier than 15 days after publication of the public notice and no later than the 60-day comment period; and 3) provide the public with at least 60 days to comment on the modification request.

This document summarizes information that can be found in greater detail in other documents ~~that can be found in the administrative record~~ (<https://semspub.epa.gov/src/collections/05/AR65683>), most notably the RCRA Facility Investigation (RFI), The RFI Addendum, the Corrective Measures Study (CMS), and the CMS Addendum. The list of documents in the administrative record is attached. These documents

may be found in the Sparta Public Library, the Tomah Public Library, the Wisconsin Department of Natural Resources offices in Madison and Eau Claire, Wisconsin, Fort McCoy office, and the EPA Region 5 office located at 77 West Jackson Boulevard, Chicago, Illinois. Colleen Olsberg, the Corrective Action Project Manager responsible for the FM facility, may be contacted at (312) 353-4686 for information about the availability of documents. EPA encourages the public to review these documents in order to gain a more comprehensive understanding of the FM facility and RCRA activities that have been conducted there. Subsequent to reviewing the documents contained in the administrative record, the public can be involved in this process by submitting comments to EPA during the 60-day public comment period.

EPA will modify the federal permit only after the required Public Comment Period has ended and the information submitted during this time has been reviewed and considered. EPA is issuing this SB as part of its public participation requirements under RCRA.

II. OBJECTIVES

The objectives of this SB are to:

- Document the hazardous waste investigation and remediation of the Fort McCoy site.
- Provide justification for the Class III Permit Modification that will result in a Corrective Action Complete determination for the Fort McCoy facility.
- Summarize information (i.e., current contamination and risks) for the final two remaining units remediated, Closed Landfill 2 (CL2) and Fire Training Burn Pit 1 (FTBP1), and ~~provide document~~ justification for ceasing groundwater monitoring at these two SWMUs.
- Provide information on how the public can be involved in the decision process.

Commented [WM1]: It will not be clear to the reader why EPA regards these 2 units as "remaining."

III. FACILITY BACKGROUND

A. Facility Location and History

Fort McCoy is a U.S. Army installation located in Monroe County in the southwest portion of Wisconsin. The installation covers approximately 60,000 acres midway between the towns of Tomah and Sparta, Wisconsin (see Figure 1).

Fort McCoy provides training for the readiness of active and reserve forces. The installation serves as a support installation, which includes supporting the needs of all training units and the post's tenant activities (Army units that occupy space at Fort McCoy, but are not under Fort McCoy command), as well as reserve centers off-post. Fort McCoy serves as a coordinating installation for U.S. Army Reserve Centers in Illinois, Indiana, Wisconsin, Minnesota, and Michigan. The installation is also a major mobilization site for U.S. Army Reserve and Army National Guard units.

Fort McCoy originated in 1905 as a training camp for the 7th Field Artillery of Fort Snelling, Minnesota. Originally named Camp Robinson, the camp became a permanent Army post in 1910 and was designated for artillery training and maneuvers practice.

Shortly after World War I, the installation was renamed the Sparta Ordnance Depot. In 1926, it was renamed Camp McCoy.

During World War II, Camp McCoy was a major center for the processing and training of troops. Up to 65,000 troops occupied the camp at any given time during military activities from 1942 through 1945, and most of the buildings that comprise the central "cantonment" (administration, support, and barracks buildings) area of the base were built at that time. After World War II, Camp McCoy served to process and train troops during periods of military mobilization and for National Guard Reserve units. In 1977, Camp McCoy became Fort McCoy and achieved status as an installation of the U.S. Army. Fort McCoy is expected to remain an active U.S. Army installation indefinitely.

B. Regulatory History

EPA and WDNR issued a joint permit in June 1990 to the U.S. Army for management of hazardous waste. The state portion of the permit (termed a "license") regulated the storage of hazardous waste in containers at the facility prior to disposal. The federal portion required FM to undertake corrective action activities at 11 SWMUs located at the facility.

At the time of permit issuance, the State of Wisconsin had not received authorization to administer the Hazardous and Solid Waste Amendments (HSWA) to the Solid Waste Disposal Act. Among other things, HSWA authorizes EPA to establish additional permitting requirements for hazardous waste management facilities beyond the scope of existing regulations, if necessary to protect human health and the environment. The State subsequently has been authorized to administer individual provisions of HSWA. However, because the State had not received authorization to address the HSWA requirements by the date on which the RCRA permit was originally issued to the U.S. Army (as owner and operator), EPA issued its own permit, jointly with the State license, addressing the HSWA requirements. The conditions contained in both the State license and the federal permit constitute the RCRA permit.

The federal permit required the Army to investigate 11 SWMUs at the facility. During the RFI, 4 additional SWMUs were discovered and added to the RFI. Two modifications to the permit were issued subsequent to the issuance of the original permit in June 1990. The first modification, which was issued in September 1997, addressed remedial alternatives for five SWMUs (Closed Landfill 2, Closed Landfill 3/Grit Area, Closed Landfill 4, Fire Training Burn Pit 2, Pesticide Disposal Area), and terminated corrective action requirements at five SWMUs (Closed Landfill 5, Closed Landfill 6, Landfill X, Active Ordnance Disposal Site, Inactive Ordnance Disposal Site, Landfill 7, Landfill 8, Landfill 9, and Landfill 10. The second modification in August 2001 required corrective measures and set clean up goals for the ~~eleventh~~ SWMU, FTBP1. See Table 1 below for specific SWMU information.

Table 1 lists the 11 SWMUs at Fort McCoy that were included in the original federal permit (June 1990) as needing investigation and potential remediation, as well as the 4

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SWMUs which were later added. Corrective action was completed at each of the 11 SWMUs where required, and the current status of land use controls at each SWMU is listed in the table.

TABLE 1
INSTITUTIONAL CONTROLS OF SOLID WASTE MANAGEMENT UNITS (SWMUs)

Solid Waste Management Unit	Land Use Control	WDNR Granted Closure	Closure Justification	COCs at Closure
Closed Landfill #2	Listed in the Wisconsin Remediation and Redevelopment Database (WRRD) as having VI Continuing Obligations for Cover Maintenance WDNR GIS Registry	June 3, 2016 USEPA agreed that groundwater monitoring could cease on December 1, 2014.	COCs are not migrating off site or entering the La Crosse River (adjacent to the facility) at levels of concern. Data show no negative impacts to aquatic life in the river. The river is functioning as Class I Trout Stream adjacent to and downstream of landfill.	Antimony (0.23 – 9.5 ppb), iron (<0.0362 – 0.584 ppm), manganese (4.7 – 343 ppb), in groundwater. These parameters exceeded MCLs at Closure.
Closed Landfill #3 & Grit Area	Listed in WRRD as having VI Continuing Obligations for Cover Maintenance WDNR GIS Registry	May 22, 2012; USEPA agreed that closure criteria had been met on December 16 2011	Groundwater concentrations, except for iron, are below the MCL. No direct contact risks with residual wastes.	Iron (0.163 – 2.77 ppm) in groundwater – due to naturally occurring concentrations.
Closed Landfill #4	Listed in WRRD as having VI Continuing Obligations for Cover Maintenance WDNR GIS Registry	June 15, 2012; USEPA agreed that closure criteria had been met on December 16, 2011	Plume margins stable to receding, COC concentrations stable within a range, and have not reached nearest ecological receptor Suukjak Sep Creek located over ¼ mile from the facility. Waste is capped, therefore, there is no direct contact with the residual waste material. Minimal risk of vapor migration to buildings. The nearest downgradient potable well is located more than a mile from the site.	iron (0.602 – 11.5 ppm), manganese (55.7 – 1,150 ppb), nitrate (4.14 – 16.7 ppm) in groundwater.

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Closed Landfill #5	Cover Maintenance Specific land use restrictions associated with closed landfills. These include potable well and cap disturbance restrictions.	Closed & Capped 1990	Post-Closure Monitoring and Cap Maintenance is ongoing. These activities are managed under the WDNR's oversight.	Latest data: Benzene (two exceedances 0.68 & 1.5 ppb), cis-1,2-Dichloroethene (one exceedance 8 ppb), iron (6 exceedances concentrations ranged from 2.1 to 34 ppm), manganese (exceedance concentrations ranged from 400 – 21,000 ppb), nitrogen, nitrate nitrite (two exceedances 4 & 6.6 ppm), vinyl chloride (one exceedance 0.53 ppb) in groundwater.
Closed Landfill #6	None Required	Landfill closed by complete removal. No further action letter for from WDNR October 18, 1993.	All waste was removed and disposed of in accordance with State and Federal regulations at a licensed landfill.	No COCs at levels of concern remained following excavation.
Pesticide Disposal Area (PDA)	<u>Listed in WRRD as having WI Continuing Obligations for Cover Maintenance</u> WDNR GIS Registry	December 1, 2008, USEPA agreed that groundwater monitoring could cease on February 13, 2008.	No MCL exceedances remain in groundwater. Residual soil contamination is at levels that are no longer contaminating groundwater. The soil cap, along with the fact that the unit is located in the buffer zone for the active munitions impact area, minimizes the risk of direct contact with residual soil contamination.	Low levels of residual concentrations of 4,4, DDT; 4,4, DDD; Dieldrin; and 4,4 DDE and related constituents in soil at depths greater than four feet below land surface.
Active EOD Site (AEOD)	WDNR GIS Registry <u>Listed in WRRD as having WI Continuing Obligations for well variance, if constructed</u>	October 29, 2003.	Energetics remaining in groundwater have no MCLs. Persistent reports of Iron and Manganese at levels above the MCLs are likely due to naturally occurring concentrations. The nearest water supply well is over a mile from the unit. Although the La Crosse River is located 530 feet east (downgradient) of the site, discharges from the site will likely have an insignificant impact on the river in relation to water quality standards. The La Crosse River downstream of the active impact area functions as a Class 1 trout stream. There were no exceedances of industrial and non-	Energetics found in groundwater include: 2,4,6-Trinitrotoluene; 2,4-Dinitrotoluene; 2-Amino-4,6-Dinitrotoluene; 4-Amino-2,6-Diinitrotoluene; HMX; and RDX. Individual concentrations of energetics ranged from 0.26 to 19 ppb. Of these only 2,4-Dinitrotoluene has a standard set and it was no longer detected at closure. Iron (0.005 – 6.28 ppm), and Manganese (6.6 – 93.6 ppm) for dissolved concentrations.

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			industrial direct contact concentrations in soil. The AEOD is located within the active munitions impact area and access to the unit is severely restricted and will remain so for the foreseeable future. Due to the present and future use of the Impact Zone the soil in the IEOD area is not a threat to human health through direct contact or ingestion.	
Inactive EOD Site (IEOD)	<u>WDNR GIS Registry Listed in WRRD as having WI Continuing Obligations for well variance, if constructed</u>	October 22, 2003.	No exceedances of USEPA Region IX Residential or Industrial Standards in soils were reported. La Crosse River is 1,600 feet east (downgradient) and the nearest water supply well is more than one mile from the site. The IEOD is located within the active munitions impact area, and access to the unit is severely restricted and will remain so for the foreseeable future. Due to the present and future use of the Impact Zone the soil in the IEOD area is not a threat to human health through direct contact or ingestion. Iron, lead, aluminum, vanadium, and cadmium were occasionally reported at concentrations above the regulatory standards. These concentrations appear to be due to naturally occurring elements, and are not related to past munitions disposal.	Energetics found in groundwater include: HMX; RDX; 2,4,6-Trinitrotoluene; 2,6-Dinitrotoluene. Of these, only 2,4-Dinitrotoluene has a standard set and it was no longer detected at closure. Individual concentrations of energetics ranged from <0.25 – 19 ppb. Manganese (3.4 – 11.6 ppm)
Fire Training Burn Pit 1	<u>Unit to be placed on WDNR GIS Registry subsequent to WDNR approval of closure Listed in WRRD as having WI Continuing Obligations for vapor investigation, if site is redeveloped.</u>	<u>Conditional WDNR Closure for Chlorinated Parameters February 15, 2016 – June 11, 2018</u> <u>USEPA agreed that groundwater monitoring could cease on December 1, 2014.</u>	Chlorinated solvent plume stable to receding. Chlorinated COCs have not reached Suukjak Sep Creek (over 1,000 ft. ft downgradient) and are not likely to ever reach the creek. No potable wells within one mile downgradient. Property boundary 2 miles downgradient. No completed human or ecological exposure	PCE (<0.47 – 10.5 ppb), TCE (<0.36 – 2.5 ppb), DCE (<0.42 – 427 ppb). PFCs are present at levels above the USEPA Health Advisory Levels. PFOA + PFOS 0.0011 – 23.510 ppb. WDNR will manage the PFC investigation.

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	and Cover Maintenance		pathways with regard to chlorinated solvents. Buildings are too far away for vapor migration threats to be an issue.	
Fire Training Burn Pit 2	None Required	October 27, 2003	12,700 gallons of liquid and 610 cubic yards of contaminated soil were removed. Confirmation samples showed that soil residuals do not exceed USEPA industrial PRGs or State of Wisconsin Industrial Standards.	PFCs are present at levels above the USEPA Health Advisory Levels. PFOA + PFOS 0.0048 – 72.400 ppb. WDNR will manage the PFC investigation.
Closed Landfill X	None Required	NA	Results of geophysical surveys and evaluation of aerial photos could not confirm the existence of Landfill X, and no further investigation was performed.	NA
Closed Landfill #7	Listed in WRRD as having WI Continuing Obligations for Cover Maintenance WDNR GIS Registry	April 12, 2007. January 16, 2008 WDNR Direction to Abandon Monitoring Wells.	There were no MCL exceedances in groundwater attributable to Closed Landfill 7 since 1994. Elevated iron and manganese concentrations common at Fort McCoy are due to naturally occurring concentrations. Elevated nitrate is flowing onto the site from an upgradient source. Landfill is capped, no waste disposed since 1964, plume is stable, property boundary is 12,000 feet to west (downgradient), no completed exposure pathways.	Iron (<0.025 – 5.6 ppm) manganese (<1.0 – 1,160 ppb) nitrate (<0.1 – 9.75 ppm)
Closed Landfill #8	WDNR GIS Registry Listed in WRRD as having WI Continuing Obligations for well variance, if constructed	October 28, 2003	The unit was remediated by excavation and complete removal of all contaminated soil and debris.	Arsenic in soil (0.24 to 6.1 – 100 µg/Kg). Iron in groundwater (10 – 209 ppm) – both caused by naturally occurring concentrations and not associated with the waste.

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¹ Closed Landfill #9	WDNR GIS Registry Listed in WRRD as having WI Continuing Obligations for well variance, if constructed	October 29, 2003	The unit was remediated by excavation and complete removal of all contaminated soil and debris.	Arsenic (0.8 to 6.1 µg/Kg) and manganese (9.4 ppm) in soil, Iron (4 – 48 ppm) in groundwater – both caused by naturally occurring concentrations and not associated with the waste.	Formatted: Superscript
¹ Closed Landfill #10	None Required	October 27, 2003	The unit was remediated by excavation and complete removal of all contaminated soil and debris.	Iron (.2 – 1.5 ppm) and manganese (0.02 – 0.75 ppm) in groundwater, arsenic (0.21 – 5.2 ppm) in soil—all likely caused by naturally occurring concentrations and not associated with the waste.	Formatted: Superscript

¹[SWMU] included in a September, 1995 addendum to the RFI

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“Cover” is defined as clean soil which serves as barrier to prevent direct contact with contamination.

“Cover Maintenance” refers to the need to regularly inspect and maintain the cover.

WDNR Geographic Information System Registry (GIS) Wisconsin Remediation and Redevelopment Database (WRRD) provides permanent notification of the presence of contamination.

PFCs: Perfluorinated Surfactants Compounds.

PFOA: perfluorooctanoic acid.

PFOS: perfluorooctanesulfonate.

NA: Not Applicable.

MCL: USEPA Maximum Contaminant Levels.

IV. CLOSURE JUSTIFICATION FOR FORT McCOY SITES LISTED IN TABLE 1

Closed Landfill #2 (CLF2):

CLF2 is essentially an ash monofill located adjacent to and above the floodplain of the LaCrosse River near FM's western boundary. The landfill was used during World War II and covers nearly six acres. Waste materials were capped in 1998. Risks associated with direct contact to waste material have been eliminated. The cap minimizes the potential risk for waste to be eroded and carried away by run-off. No water supply wells are located within 1,200 feet of the unit, per WDNR NR812.08 (https://docs.legis.wisconsin.gov/code/admin_code/nr/800/812/1/08). Groundwater data show that concentrations of antimony, cadmium, iron, and manganese may be leaching from the waste and that increased sulfate concentrations have likely been caused by this leaching. Concentrations of antimony, iron, and manganese in groundwater exceeded MCLs at closure. However, these chemicals are not migrating off-site or entering the La Crosse River at levels of concern (the data also show that the surface water, sediment, and aquatic biota in the La Crosse River have not been and are not being negatively impacted). As a matter of fact, the La Crosse River adjacent to Closed Landfill #2 is functioning as a Class I Trout Stream. Closure will require the unit to be placed listed on the Wisconsin GIS (geographic information systems) Registry Remediation and Redevelopment Database (WRRD) as having WI Continuing Obligations. (a program that WRRD provides notification of the presence of contamination on all affected properties and utilizes statutory authority to institute restrictions that carry forward to all subsequent property owners). Fort McCoy and all subsequent owners will be required to maintain the cap and obtain WDNR's prior approval if any water supply wells are to be installed near CLF2. In December 2014, EPA agreed that groundwater monitoring could cease. WDNR approved final unit closure on June 3, 2016.

Closed Landfill #3 (CLF3) & Grit Area:

CLF3 consists of the landfill area south of the Waste Water Treatment Plant (WWTP). The Grit Area is adjacent to the east side of the WWTP. CLF3 was reportedly used for one year in 1950 for disposal of ash, clinker, and noncombustible refuse. The Grit Area was utilized to dispose of solids from the WWTP.

Risks associated with direct contact to waste material have been eliminated. No water supply wells are located within 1,200 feet of these areas. Groundwater monitoring data collected over a period of 16 years show that concentrations of constituents of concern (metals and nitrates) are stable to decreasing and concentrations are all below MCLs, except iron. This indicates that the plume margins with respect to each of these constituents are stable. The length of the monitoring record, the type of waste buried, and the length of time since the landfill closed (over 60 years), all support the conclusion that future concentrations of all COCs will remain within historical data ranges and are likely to decrease.

On December 16, 2011, EPA issued a letter approving abandonment of monitoring wells at CLF3. WDNR approved final unit closure on May 22, 2012. WDNR closure conditions included placing required listing these two areas on the Wisconsin GIS Registry Remediation and Redevelopment Database as having WI Continuing Obligations, which include maintaining the

cap, and restricting installation of water supply wells without prior WDNR approval. The area is also listed on the Fort McCoy land use GIS.

Commented [WM7]: DNR does not have authority to strictly prohibit water supply wells.

Closed Landfill #4 (CLF4):

CLF4 was reportedly used from 1951 to 1960 for disposal of foodstuffs, cans, and general kitchen refuse. The landfill is located beneath a tactical vehicle storage yard, covers an area of approximately 510 feet by 765 feet, and is approximately 2,500 feet from the nearest creek.

Constituents of concern are iron, manganese, and nitrates. Risks associated with direct contact to waste material have been eliminated. No water supply wells are located within 1,200 feet of this area. Groundwater monitoring data collected over a period of 18 years show that concentrations of constituents of concern are stable to decreasing. This indicates that the plume margins with respect to each of these constituents are stable. The length of the monitoring record, the type of waste buried, and the length of time since the landfill has been closed (over 50 years), all support the conclusion that future concentrations of all COCs will remain within historical data ranges and are likely to decrease.

On December 16, 2011, EPA issued a letter stating that monitoring wells at CLF4 could be abandoned. On June 15, 2012, WDNR issued final closure approval for CLF4. WDNR closure conditions include placing required listing the area on the Wisconsin GIS Registry Remediation and Redevelopment Database as having WI Continuing Obligations, which include maintenance of the cap over the unit, and restricting water supply well installation without prior approval of the WDNR. The area is also listed on the Fort McCoy land use GIS.

Closed Landfill #5 (CLF5):

CLF5 was a WDNR-permitted sanitary landfill that was used from 1965 to 1989. The trench and fill landfill began operation in 1965 under the WDNR Solid Waste Facility Operation Permit Number 02820 to serve the solid waste disposal needs of the installation.

Remedial action in this area consisted of installing an engineered cap in 1991. The cap consisted of two feet of clay, one foot of native soils, and six inches of topsoil. Gas vents were incorporated into the cap. Final grade was designed with a 2% slope to allow surface runoff and eliminate ponding. The cap, including vegetation (grass), gas vents, and other components, is inspected annually. Repair and revegetation is conducted as necessary. Fencing and signs restricting access are present on the south end of the unit. The grass established on the cap is mowed at least annually.

Constituents of concern are benzene, cis-1,2 dichloroethene, iron, manganese, nitrogen, nitrates, nitrites, and vinyl chloride. Risks associated with direct contact to waste material are minimal. CLF5 is located approximately 1,000 feet upgradient of the nearest creek. Concentrations of chemicals of concern in groundwater are stable. No water supply wells are located within 1,200 of the landfill.

WDNR has the responsibility for long-term monitoring at this landfill.

Closed Landfill #6 (CLF6):

CLF6 was located northeast of the Cantonment Area, at the then-proposed Central Vehicle Wash Rack Facility. CLF6 was used to dispose of demolition debris and some petroleum-contaminated soil.

CLF6 was remediated by excavation during construction activities. All removed material was disposed in accordance with WDNR regulations. Risks associated with direct contact with any remaining waste material are minimal. Groundwater monitoring showed no evidence of groundwater impacts. Demolition debris and contaminated soil were excavated, removed, and properly disposed of.

The WDNR provided a letter on October 18, 1993 stating "that the landfill has been adequately excavated and no further action is necessary." In the mid-1990s, the Central Vehicle Wash Rack Facility was constructed at that location and has been in use since that time.

Pesticide Disposal Area (PDA):

The PDA was an unlined disposal area located adjacent to the active impact area (area with restricted access due to firing of munitions and safety hazards from unexploded ordnances) and northwest of the Cantonment Area, approximately 1,000 feet east of the La Crosse River. The disposal area was utilized from the mid-1940s until 1965 to dispose of empty pesticide containers. Pesticides utilized at that time at the facility included DDT, diazinon, 2,4-D, lindane, dieldrin, and 2,4,5-T. Records indicate that laundry cleaning solvent may also have been disposed of at the PDA.

Risks associated with direct contact to waste material are minimal. In 1993, over 1,000 tons of contaminated soil and empty containers were excavated and removed from the unit and disposed of at licensed landfills. Groundwater monitoring data showed that the concentration of COCs was not changing and that these concentrations were below the MCLs.

In 2008, after meeting cleanup requirements, Fort McCoy received approval from EPA to cease groundwater monitoring at the Pesticide Disposal Area, and the monitoring wells were abandoned. Access, land, and groundwater use restrictions are in place at this unit as well as cover maintenance requirements. In December 2008, the WDNR granted unit closure with a requirement for listing the site on the Wisconsin GIS Registry Remediation and Redevelopment Database as having WI Continuing Obligations, in December 2008. Conditions of closure which include maintaining the soil cap at the unit and a restriction on constructing water supply wells in the area without prior WDNR approval.

Active Explosive Ordinance Detonation (EOD) Site (AEOD):

The AEOD is a small pit that was originally created by the detonation of ordnance that was disposed of in the pit. This SWMU is located within the Fort McCoy active impact area (area with restricted access due to firing of munitions and safety hazards from unexploded ordnances), approximately 530 feet west of the La Crosse River. The AEOD operated as a licensed explosive ordinance treatment facility from May 1996 to June 1999. The unit was used to treat waste munitions and explosives by open detonation. Fort McCoy made the decision in December 1998 to deactivate the unit and no longer conduct treatments after June 1, 1999.

Energetic constituents of concern found in groundwater include 2,4,6-trinitrotoluene, 2,4-dinitrotoluene, 2-amino-4,6-dinitrotoluene, 4-amino-2,6-dinitrotoluene, High Melting Explosive (HMX), and Research Department Explosive (RDX). Energetics remaining in groundwater have no MCLs. Groundwater data showed that constituent of concern concentrations had decreased and are not rebounding. There are no exceedances of industrial and non-industrial direct contact screening levels in soil. Risks associated with direct contact to waste material are minimal. The nearest potable well is located more than a mile from the unit. The pit was filled with soil in September 1999.

Commented [WM8]: According to the WDNR closure letter, this appears to be correct. However, RDX exceeded a Lifetime Health Advisory Limit in some wells.

There are very restrictive access controls at the AEOD due to unexploded ordnance at the unit. People are not allowed into the active impact area unless accompanied by an Explosive Ordnance Team and wearing Kevlar. The Military Munitions Rule allows for the UXO, lead, copper, and accelerants to remain in place, without cleanup, in these active range areas until the range is closed. This range complex will remain operational until the time that Fort McCoy would close. If Fort McCoy were to close, this entire range complex, along with the range complex on the southern part of the installation, as well as current inactive ranges on the installation, will be evaluated and remediated. The evaluation and remediation methods to be used will depend upon the specific technology available at that time and upon the proposed future use of each of these areas.

The WDNR granted closure of the unit on October 29, 2003. This unit is listed on the Wisconsin GIS Registry Remediation and Redevelopment Database to document exceedances of a Lifetime Health Advisory in some groundwater wells and to provide notice of this residual contamination for future land use planning purposes.

Inactive EOD Site (IEOD):

Fort McCoy operated the Inactive EOD Site until 1987. The exact dates of operation are unknown. The IEOD was used to treat munition and explosives by open detonation and was located south of the AEOD within the active impact area (area with restricted access due to firing of munitions and safety hazards from unexploded ordinances). The IEOD covers one acre within the 12 square mile impact area. It is located 1,600 feet west of the La Crosse River.

Energetic constituents of concern found in groundwater include 2,4,6-trinitrotoluene, 2,6-dinitrotoluene, HMX, and RDX. Energetics remaining in groundwater have no MCLs. The nearest potable well is more than one mile from the unit. Although iron, lead, aluminum, vanadium, and cadmium were occasionally reported in groundwater, the concentrations appear to be due to naturally occurring elements and are not likely related to past disposal practices at the IEOD. Soil at the unit was found to contain some energetic constituents and lead, but risks associated with direct contact to waste material are minimal.

The unit is surrounded by unexploded ordnance and has very restrictive access controls. No one goes into the active impact area unless they are accompanied by an Explosive Ordnance Team and are wearing Kevlar. The Military Munitions Rule allows for the unexploded ordnance (UXO), lead, copper, and accelerants to remain in place, without cleanup, in these active range areas until the range is closed. This range complex will remain operational until the time that Fort McCoy would close. If Fort McCoy were to close, this entire range complex, along with the

range complex on the southern part of the installation, as well as current inactive ranges on the installation, will be evaluated and remediated. The evaluation and remediation methods to be used will depend upon the specific technology available at that time and upon the proposed future use of each of these areas.

The WDNR issued final unit closure on October 22, 2003. The unit is listed on the Wisconsin GIS Registry Remediation and Redevelopment Database to document exceedances of Lifetime Health Advisories in some groundwater wells and to provide notice of this residual contamination for future land use planning purposes.

Fire Training Burn Pit #1 (FTBP1):

FTBP1 is located in a tactical vehicle storage yard, approximately 1,500 feet east of Squaw Saukjak Sep Creek, and more than 200 feet from the nearest building. Fire Training Burn Pit 1 was constructed sometime between 1966 and 1973. It was approximately three feet deep and had a diameter of approximately 40 feet. The pit was utilized for training Fort McCoy Fire Department personnel. Training was conducted by filling the pit with a layer of water and fuel. The fuel was ignited and extinguished, then re-ignited and extinguished several times until it was consumed.

In 1982, a portion of the contaminated soil was removed from the pit. Following soil removal, the pit was reportedly lined with plastic. Two feet of clay was then placed on top of the plastic, and a 1-foot thick clay berm was installed around the pit. After installation of the plastic liner and the clay, the pit was used until at least 1987 when it was graded flat. The pit has not been used since the late 1980s. Remediation of the soil was conducted utilizing in-situ microbial degradation. In 2006, the remaining contaminant mass (60 cubic yards) was excavated and disposed of at a licensed landfill, and the area of the former pit was capped with 2.5 feet of gravel.

Fort McCoy has multiple potable wells located various distances from FTBP1. Eleven potable wells are located primarily to the north of FTBP1. Five wells that supply water to the Cantonment Area, Campground, and Ski Hill facility are located approximately two miles southeast of FTBP1. Two potable wells are present at the South Post Housing facility located approximately 4.5 miles southwest of the FTBP1. One well at the Fort McCoy Airfield is located approximately 6 miles southwest of the FTBP1. The nearest potable water well is 1.4 miles west of the FTBP1. These potable wells are sampled yearly, and have always been shown to be free of contaminants.

Constituents of concern in groundwater include tetrachloroethylene (PCE), trichloroethylene (TCE), and 1,2-dichloroethene (DCE). In addition, and-perfluorinated compounds (PFCs) found in Aqueous Film Forming Foam (AFFF) are present (See Section VII). Data from over twenty years of groundwater monitoring show that the concentration and mass of PCE, TCE, and DCE continue to decrease (Table 2). The contaminant plumes never reached the creek and are receding.

Closure will require the unit to be placed on the Wisconsin GIS Registry Remediation and Redevelopment Database as having WI Continuing Obligations, and Fort McCoy and all subsequent owners will be required to maintain the cap and obtain prior approval from the WDNR if any water supply wells are planned to be installed near the unit. In December 2014, EPA agreed that groundwater monitoring could cease. WDNR approved final unit closure on June 11, 2018.

In September 2016, December 2016, and August 2017, sampling and analysis was done at FTBP1 for eight constituents that are typically found in groundwater at former Army fire training sites where AFFF has been used. Results of these sampling events are included in Table 4. The data show significant concentration fluctuations between sampling events for wells OW117, OW308, and OW141, located in the center of the groundwater plume flow path. Data collected so far have confirmed that PFC concentrations near and downgradient of the former FTBP1 are present at levels exceeding the HA level. WDNR issued a letter on May 25, 2018, requiring site investigation. If a future remedy is determined to be necessary following complete definition of the nature and extent of impacts, WDNR will ensure that public health and the environment are protected.

~~No completed human health or ecological exposure pathways exist currently for AFFF at FTBP1 and these pathways are not likely to be completed in the future. In this respect, the unit is approximately 1,300 feet upgradient of Suukjak Sep Creek, the nearest downgradient drinking water well is approximately 1.4 miles west of the facility, and no non-potable wells exist close to the facility. If a future remedy is determined to be necessary for FTBP1, WDNR will ensure that public health and the environment are protected.~~

Commented [WM9]: It is NOT appropriate (or necessary) to speculate on whether exposure pathways are complete until the AFFF SI is complete. As stated here and in Section VII, this info is unrelated to CA requirements. I suggest this paragraph (as revised) be kept to Section VII.

Additional information on this area and discussion of results are included in *Section VII. Ongoing Investigations Unrelated to Federal Corrective Action Requirements.*

Fire Training Burn Pit #2 (FTBP2):

FTBP2 area is located on the east side (southern portion) of the north/south runway of the Fort McCoy Airfield. The area is located approximately 3,300 feet south of Silver Creek. The now excavated and backfilled pit was approximately 30 x 40 feet and was initially constructed by excavating a soil pit to a depth of approximately 3 feet. It is not known when the pit was constructed. Fire suppression training consisted of filling the pit with water and fuel followed by ignition of the fuel source that stayed on top of the water. Fire fighters ignited and extinguished the fuel repeatedly until the fuel was considered spent.

In 1982, contaminated soil was removed from the pit. The excavated pit was then partially backfilled with clean sand. A plastic liner was placed on top as an impermeable barrier followed by a two-foot lift of clay. A one-foot thick clay berm was installed around the edge and used as a sidewall. These actions were taken in an attempt to clean up the unit and minimize future contamination during training. In 1992, fire suppressant training at FTBP2 was discontinued. In 1994, approximately 12,700 gallons of liquid, 610 cubic yards of soil, and the liner were removed and disposed of at a permitted landfill. Post remediation soil sampling showed that constituents of concern are below the industrial Preliminary Remediation Goals (PRGs), and groundwater monitoring showed that constituents of concern are below MCLs (constituents of

concern included TCE, PCE, arsenic, barium, chromium, lead, and mercury). The WDNR granted final closure of the unit on October 27, 2003.

In October 2016, sampling and analysis was done at FTBP2 for eight constituents that are typically found in groundwater at former fire training sites where Aqueous Film Forming Foam (AFFF) has been used. Groundwater samples were collected from 11 Geoprobe borings in the vicinity of former FTBP2 (Figure 2) and analyzed for PFCs. The October 2016 results are summarized in Table 5. As shown, the PFC contaminant concentration at FTBP2 showed five Geoprobe samples with combined PFOA and PFOS concentrations below the Health Advisory (HA) level and six samples with PFC concentrations above the HA levels. WDNR issued a letter on May 25, 2018, requiring site investigation which will ensure that public health and the environment are protected.

~~No completed human health or ecological exposure pathways exist currently for AFFF at FTBP2 and these pathways are not likely to be completed in the future. AFFF use at FTBP2 began prior to 1982. The last time AFFF was used at FTBP2 was in 1992. Combined concentrations of PFOS and PFOA at levels exceeding the HA do not extend beyond the north/south runway of the airfield and only extend approximately 740 feet north of FTBP2. This is approximately 2,400 feet south of Silver Creek. It is likely that the downgradient plume boundary has reached its maximum extent, and is stable or receding based on the fact that it has been over 34 years since AFFF has been used at the airfield. Finally, if a future remedy is determined to be necessary for FTBP2, WDNR will ensure that public health and the environment are protected.~~

Commented [WM10]: Again, it is not appropriate or necessary to speculate on pathway completion or extent of AFFF contamination until SI is complete. Please keep this info (as revised) to Section VII.

Discussion of results are included in *Section VII. Ongoing Investigations Unrelated to Federal Corrective Action Requirements*.

Closed Landfill X:

The RCRA Facilities Assessment identified Landfill X as one of 11 SWMUs that should be investigated. An area northwest of the Cantonment Area is believed to be the location of Landfill X, and was identified by representatives of the US Army Corps of Engineers and Fort McCoy for investigation as to the existence of the landfill. It was believed that some wastes may have been buried at this location during the early 1950s. A search of historical records, including a review of aerial photos taken between 1946 and 1986, provided no evidence of waste disposal or landfilling activity at this location. Electromagnetic and magnetometer geophysical surveys of the 800-foot x 560-foot area found no evidence of buried waste.

The Administrative Record does not include the any information suggesting Landfill X's presence. The Remedial Investigation (1994) report states that "An area believed to be the location of Landfill X was identified by representatives of the USACE and Fort McCoy to investigate the existence of the landfill. No records or other information exists to substantiate the existence of this landfill." The Current Conditions Report (1992) states that "Landfill X was reportedly used until 1951, but it is unknown if and when the landfill was first used. Information is not available regarding specific debris which may have been placed in the landfill." It is not likely that any individuals interviewed in 1992 or 1994 witnessed activities that may have occurred in 1951.

This SWMU was not investigated any further (no sampling was conducted) during subsequent field investigations for the RFI for two reasons- first, there was no evidence of landfilling activities from review of historical aerial photos and records, and second, there were no indications of buried waste from the geophysical investigations at Landfill X. No threat to human health or the environment was detected at this suspected SWMU, and no further action was taken.

Closed Landfill #7 (CLF7):

Based upon evidence from aerial photographs, CLF7 was utilized to dispose of municipal waste between 1950 and 1964. The landfill was discovered during grading work in 1993, extends to as much as 18 feet below ground surface, and covers approximately 1 acre. The unit is located north of the Cantonment Area, is over two miles from Fort McCoy's western boundary, and is beneath a tactical vehicle recycling yard. The landfill is approximately 1,800 feet from Squaw Suukjak Sep Creek.

There are no potable water wells within 1,200 feet of the unit. Groundwater monitoring data indicates that the risks to public health are minimal. At the time of closure, the only chemicals of concern reported in downgradient wells above screening levels were iron, manganese, nitrate, and PCE. At that time, Mann-Kendall analysis (a test which is a non-parametric way to detect a trend in a series of values) of the iron and manganese data showed that concentrations were stable to decreasing. In addition, a review of data from downgradient wells at closure showed that PCE concentrations were stable or decreasing. These results suggest that the plume is stable.

The WDNR granted unit closure on April 12, 2007. Closure required the unit be ~~placed~~ listed on the GIS Registry Wisconsin Remediation and Redevelopment Database as having WI Continuing Obligations, requires Fort McCoy and all subsequent owners to maintain the cap, and places restrictions on well installation without prior WDNR approval. In January 2008, the WDNR requested that Fort McCoy abandon the monitoring wells at CLF7 due to the fact that WDNR regulations require that monitoring wells not in use, and not likely to be used in the future, be abandoned. Two of the three monitoring wells at CLF7 were abandoned in November 2008. The third well (OW145, a downgradient well for CLF7) was left in place to function as an upgradient well for FTBPI. OW145 has been utilized in that manner since that time.

Closed Landfill #8 (CLF8):

CLF8 is located at Fort McCoy's western edge. A private citizen brought this unit to the attention of Fort McCoy authorities. There are no records to indicate when the waste was placed at the landfill. Prior to excavation, CLF8 was verified to exist in a clearing located approximately 3,300 feet west of the La Crosse River. The waste occupied two areas totaling 0.09 acres to a depth of 3.2 feet below ground surface.

There are no records to show when this landfill was used. Based on available aerial photographic information, this location appeared to be non-vegetated from 1950 to 1964. Use of this unit may have occurred during this period. Waste materials found in Landfill #8 included glass jars and bottles, metal cans, wire, a rubber overshoe, concrete blocks, bones, wood fragments, porcelain fragments, and ash. Based upon the type of materials found in Landfill #8, past investigations suggested that Fort McCoy personnel were not the cause of the solid waste

accumulation, but that filling was performed by neighboring households or passersby. All waste was removed from the unit and the area was backfilled and capped with clean soil.

Elevated levels of lead and arsenic were present in soil following waste removal. The soil cap would prevent exposure to residual concentrations of contaminants in soil, and Fort McCoy is required to maintain the soil cap over the unit. Groundwater samples indicate that only manganese and iron, both naturally occurring, were present at levels exceeding the MCLs. Background concentrations of iron and manganese in shallow groundwater throughout Fort McCoy are found at levels above MCLs. Potable wells on and off Fort McCoy access the Cambrian Sandstone bedrock aquifer which is much deeper than the alluvial material sampled by the former shallow groundwater monitoring wells at Landfill 8. There are no potable wells located near the Landfill 8 site. There are no completed human exposure pathways for this shallow groundwater that contain concentrations of iron and manganese in excess of the MCLs at the Landfill 8 site. No access restrictions exist for this landfill.

The WDNR issued the unit closure letter on October 28, 2003. The unit was listed on the Wisconsin Remediation and Redevelopment Database with WI Continuing Obligations. If excavation is ever planned for this unit, Fort McCoy must notify the WDNR in advance and sample the excavated soil and handle and dispose of the soil in accordance with the regulatory requirements that exist at the time any excavation occurs. The unit was placed on GIS Registry.

Closed Landfill #9 (CLF9):

CLF9 is located in a gully on the western boundary of Fort McCoy, 1/4 mile north of CLF8. This unit occupied an area of approximately 10 feet x 30 feet to a depth of 3 feet. There are no records to show when this landfill was used.

There is no indication of landfill activity on available aerial photographs, nor do any past Fort McCoy employees who were interviewed recall landfill activity at this unit. Materials found in CLF9 during trenching activities conducted in July of 1993 included glass jars, bottles, barbed wire, nails, stove pipe, metal cans, buckets, and miscellaneous other items. The waste was excavated and removed, but not sampled prior to removal. Confirmation soil sampling only showed arsenic. Arsenic levels in soil were elevated although below the average background concentrations. Although several metals in groundwater, including beryllium, cadmium, iron, lead, manganese, silver and vanadium, were occasionally reported at concentrations above the NR 140 standards, these concentrations appeared to be due to naturally occurring elements, and were not related to disposal practices at the Landfill #9.

This landfill was covered with a soil cap that would prevent exposure to residual concentrations of contaminants in soil. The landfill has been listed on the GIS Registry Wisconsin Remediation and Redevelopment Database with WI Continuing Obligations for soil due to the arsenic concentrations. Any soil excavated from the area will require testing and proper disposal. There are no access restrictions for this landfill. The WDNR issued the final unit closure approval on October 29, 2003.

Closed Landfill #10 (CLF10):

Closed Landfill #10 (CLF10) was located on the western boundary of Fort McCoy, southwest of the Cantonment Area. The unit is 1,700 feet west of the La Crosse River. This unit, prior to excavation, was verified to exist in the firebreak along the western boundary of Fort McCoy slightly north of Highway BB. The waste occupied an area of approximately 30 feet x 140 feet to a depth of between one to six feet. There are no records to show when this landfill was used.

There is no indication of landfill activity on available aerial photographs nor any past Fort McCoy employees who were interviewed recall landfill activity at this unit. Waste materials found in CLF10 during trenching activities conducted on July 20, 1993, included glass bottles, broken glass and dishes, barbed wire, cans, rusted metal debris, and ash. Nine trenches were excavated to determine the limits of waste and identification of the above stated items. Only four of the nine trenches encountered waste during the preliminary investigation. The waste was excavated and removed, but not sampled prior to removal, and the area was backfilled with clean soil. Soil samples collected following excavation showed no residual soil contaminants of concern. Groundwater samples showed MCL exceedances for manganese, a naturally occurring element that is found at elevated levels throughout Fort McCoy.

On October 27, 2003, the WDNR issued the final closure letter stating that they consider this CLF10 closed and no further investigation, remediation, or other action is required at this time.

V. EVALUATION OF RESIDUAL RISKS AT CLOSED LANDFILL #2 AND FIRE TRAINING BURN PIT#1

As of October, 2012, nine of the 11 SWMUs requiring corrective action, as stated in the original June 1990 permit (see Table I), ~~nine SWMUs~~ have been determined to have met the requirements for closure either through remediation or institutional controls that would prevent potential future exposure to human or ecological receptor populations. In October 2012, Fort McCoy submitted current conditions reports to EPA for the two remaining units, (CLF2 and FTBP1), with ongoing groundwater monitoring. These reports summarized all remedial actions and current groundwater conditions at both units, and included the initial evaluation of current human and environmental risks posed by these units. In January 2014, the installation submitted a final summary of current human health and environmental risks presented by these two units (see Section VI. *Justification for Corrective Action Complete Determination at Fort McCoy*). In December 2014, EPA determined that groundwater monitoring could cease at CLF2 and FTBP1. WDNR issued final closure letters for CLF2 and FTBP1 on June 3, 2016 and June 11, 2018, respectively. Section V and Section VI of this document provide specific information which forms the basis for the decision to close both CLF2 and FTBP1. Below is an overview of the history of, and remedial actions at, these two units.

CLOSED LANDFILL #2 (CLF2)

A complete presentation and discussion of the data EPA references below is presented in the Closed Landfill 2 Current Conditions Report dated October 2012 (available in the facility administrative record- <https://semspub.epa.gov/src/collections/05/AR65683>). Analytical results for the last three sampling events for groundwater are presented in Table 3.

History and Description:

CFL2 is located adjacent to and above the floodplain of the La Crosse River near FM's western boundary (see Figure 3). CLF2 is an unlined disposal facility reportedly used between 1942 and 1945 primarily to dispose of incinerator ash from the burning of solid waste generated at FM. The landfill is comprised of a sand-textured soil, ash, and grit mix which forms a nearly level plateau above former wetland areas of the floodplain. Reports indicate that the landfill was closed in 1949. There is evidence that some debris was discarded at the landfill during subsequent years. The cover of the landfill consists of sandy soil with native vegetation.

Summary of Risks and Remedial Actions:

Risks - Samples of groundwater, surface soil, subsurface soil, surface water, LaCrosse River sediment, and leachate (from water migrating through the waste and seeping out of the bottom of the slope formed by the ash material) were collected during the RFI. RFI sampling indicated elevated levels of metals in surface and subsurface soil samples, and the presence of volatile organic compounds (VOCs) and metals in groundwater beneath the landfill. The Current Conditions Report provided the data to show that only antimony, cadmium, iron, lead, and manganese may be leaching from the waste. Concentrations of these contaminants that may be leaching from the waste have been essentially stable (remain unchanged) to decreasing over the last few years. Surface water and sediment samples indicated that contaminant compounds did not appear to be migrating into the La Crosse River from the landfill.

A human health and environmental risk assessment indicated that the landfill contaminants in soil and groundwater contributed to an unacceptable risk to human health based on a hypothetical future resident scenario. However, using the non-residential scenario, existing soil contamination levels did not create an excess health risk. This area is not a residential area now, nor is it expected to be in the future.

Ecological risks are minimal at CLF2. The concentrations of contaminants present in the sediment, adjacent to and downgradient of the unit, are well below the thresholds that would likely cause detrimental impacts to the benthic organisms. Therefore, there is no reason to believe that the CLF2 has degraded the sediment in the La Crosse River. In addition, data shows that the landfill is not releasing contaminants at levels of concern for the biological communities present. The landfill is essentially an ash monofill that has been rinsed by infiltration of precipitation and groundwater flow for more than 60 years; 60 years of weathering has reduced the risk of contaminant concentrations increasing in the future.

Remedial Actions - The 1997 Permit Modification required installation of a soil cover along with erosion protection/slope stabilization to prevent erosion of landfill materials into the La Crosse River. The soil cover, which was installed in 1998, prevents exposure from direct contact with contaminated soils. As part of cover installation, material was moved from along the edge of the river and placed on top of the landfill as the grading layer. The surface of the landfill was graded to direct the majority of surface water runoff away from the river. The cover has been vegetated with native prairie grasses. The facility and the WDNR conduct annual cover inspections.

Natural attenuation has reduced concentrations of groundwater contamination. FM has performed semiannual groundwater monitoring until the Media Cleanup Standards (MCSs) listed in the 1997 Permit Modification were achieved.

Access, land, and groundwater restrictions have been included in the remedy to prevent disturbance of, or interference with, the remedy and to prevent exposure to contaminated soils and groundwater by receptors. Groundwater use restrictions prevent access to contaminated groundwater by the ~~prohibition~~ restriction of water supply wells within 1,200 feet of the units without prior WDNR approval, per WDNR NR 812.08.

FIRE TRAINING BURN PIT #1 (FTBP1)

A complete discussion of the data EPA references below is presented in the Former Fire Training Burn Pit #1 Current Conditions Report dated October 2012 (available in the facility administrative record- <https://semspub.epa.gov/src/collections/05/AR65683>). Analytical results for the 2012-2013 three sampling events for groundwater are presented in Table 2. In September 2016, December 2016, and August 2017, sampling and analysis was done at FTBP1 for eight constituents that are typically found in groundwater at former fire training sites where Aqueous Film Forming Foam (AFFF) has been used. Results of these sampling events are included in Table 4. Discussion of results are included in *Section VII. Ongoing Investigations Unrelated to Federal Corrective Action Requirements*.

History and Description:

Fire Training Burn Pit #1 (FTBP1) was constructed sometime between 1966 and 1973 (see Figure 4). The pit was approximately 3 feet deep and had a diameter of approximately 40 feet. It was utilized for training Fort McCoy Fire Department personnel. Training was conducted by filling the pit with a layer of water and fuel. The fuel was ignited and extinguished, then re-ignited and extinguished several times until it was consumed. In 1983, contaminated soil was removed from the pit. Following soil removal, the pit was reportedly lined with plastic. Two feet of clay was then placed on top of the plastic, and a 1-foot thick clay berm was installed around the pit. The pit was graded flat in 1987. The area of FTBP1 is currently used as a tactical vehicle storage area and has been for many years. The installation master plan intends to continue this use.

Remedial Actions:

Remediation included air sparging/soil vapor extraction (AS/SVE), ozone injection, and in-situ microbial degradation. Eventually, all but 60 cubic yards of soil was successfully remediated. The remaining soil was excavated and disposed at a licensed landfill off-site. Combined, these remedial actions removed the source of potential future groundwater contamination.

Soils at FTBP1 have been remediated and no source of groundwater contamination now exists. The location of shallow groundwater exceeding media cleanup standards is well documented. Chemicals of concern in groundwater at the last sampling date of 10/2013 were TCE, cis-1,2-DCE, vinyl chloride, and PCE (see Table 2 for concentrations). The nearest downgradient potable well is located 1.4 miles to the west of the unit which is outside the 1200 feet NR812.08 limit. Institutional controls in the form of land use restrictions and groundwater use restrictions will be put in place after WDNR approves closure to prevent future exposures. As a condition of closure, the unit will be placed on the WDNR GIS Registry for residual soil and groundwater impacts. Other conditions of closure will prohibit excavation in the former pit area without prior approval from WDNR. Any excavated material shall be disposed of (based upon testing results)

in accordance with the regulation in existence at that time. In addition, installation of drinking water wells will also be ~~prohibited~~ restricted without prior WDNR approval. Finally, any buildings constructed near the area of the groundwater plume will be required to be equipped with vapor venting systems if needed, based upon vapor sampling conducted at the time of construction. The Fort McCoy master plan includes no building construction in the area of the groundwater plume and no wells in the unit's area.

The current area surrounding FTBP1 is used for parking heavy equipment and military vehicles, and access is restricted by a fence and guarded gate. The area is zoned as "Maintenance", equivalent to "Industrial" in the private sector.

VI. JUSTIFICATION FOR CORRECTIVE ACTION COMPLETE DETERMINATION AT FORT MCCOY

In summary, all 11 SWMUs requiring corrective action, as documented in the original June 1990 permit (see Table 1), have been determined to meet the requirements for closure either through remediation or institutional controls that would prevent potential future exposure to human or ecological receptor populations (residential use at Fort McCoy is limited to the South Post housing which is far removed from any of the SWMUs). Data from 10 of the 11 SWMUs, with Closed Landfill 5 (CLF5) being the exception, show that either the media cleanup standards have been reached or that remaining soil/groundwater contamination does not present an unacceptable risk to human health or the environment. ~~Three~~ Two of the original 11 SWMUs still have groundwater monitoring wells which are CLF5, ~~CLF2~~, and FTBP1. CLF5 was a municipal solid waste landfill where a clay cap was installed, with long-term monitoring and cap maintenance conducted under the direction of the WDNR (annual inspection and documentation required). Justification for closure of CLF2 and FTBP1 as part of the corrective action complete determination is provided below.

Closed Landfill #2:

CLF2 was primarily an ash monofill. Nearly all the waste present in CLF2 was incinerator ash. A soil cover was placed on CLF2 in 1998 to prevent exposure to potential receptors as well as to provide for increased protection of the La Crosse River by reducing passage of surface precipitation through the ash. Leaving the waste in place provides the best option at this unit, because the waste is adequately covered and controlled at CLF2 and there is no reason to believe that the minimal risks to human health and the environment will increase in the future.

An analysis of the data shows that there is no unacceptable risk to human health and the environment at CLF2. EPA believes that remediation at CLF2 is complete and groundwater monitoring can cease, based upon the following:

- The landfill was properly covered. Cover construction does not allow direct contact or erosion of the ash. Maintenance of the landfill cover will prevent future exposures to contaminants remaining in the landfill.
- Concentrations of COCs antimony, cadmium, iron, lead, and manganese in groundwater associated with the waste are stable to decreasing.
- The landfill cover and liner prevent movement of waste material into the La Crosse River.

- COCs in concentrations exceeding applicable surface water quality standards are not discharging to the La Crosse River.
- The La Crosse River is not used as a drinking water source at any location along its entire length.
- There are no water supply wells within 0.65 miles downgradient of the unit, decreasing the likelihood of human exposure to groundwater.
- Fort McCoy property extends 0.65 miles downgradient (west) of the unit. Therefore, the installation controls all activities and construction between the landfill and the property boundary.
- Access restrictions, land use restrictions, and groundwater use restrictions and the existing cover will prevent exposures to contaminants remaining at the landfill.

Based upon a complete evaluation of the available monitoring data, in December 2014, EPA agreed that the groundwater monitoring at FTBP1 and CLF2 could cease based on the following: 1) groundwater was monitored and no contaminant levels were found that would result in unacceptable risk; 2) the lateral extent of groundwater was limited at that time; and 3) in the absence of receptors, no human exposure existed. WDNR was to place both units on the WDNR GIS Registry after approving well abandonment. Cover maintenance would continue at CLF2, and EPA will require FM to install a ventilation system on any structure that was built over the remaining groundwater contaminant plume at FTBP1. In addition, a vapor burner was another viable option in the case of structure installation, provided testing showed that enough vapors were being generated to utilize that technology. There would also be restrictions against installation of potable wells near both units.

Commented [WM11]: The location and content of this paragraph is super confusing because it only discusses EPA's thinking as of 2014, and it discusses both sites. I'm guessing it was from an earlier draft and that you meant for the final paragraph in this section, which is more pertinent and much clearer, to replace it. (If you do intend to use this paragraph, it will need some revision.)

Fire Training Burn Pit #1:

Fort McCoy Fire Department personnel used FTBP1 during fire control training. Soil remediation at FTBP1 included the use of ozone injection, air sparging/soil vapor extraction, and in-situ bioremediation, followed by excavation and removal of a small volume of remaining soil that was above remedial objectives. The extent of the downgradient groundwater plume has fluctuated over time; the maximum extent of the plume was 685 feet downgradient from the former FTBP1. Monitoring results have shown that the maximum extent of contaminant migration is well-defined with regard to potential receptors. This allows for definitive determinations of current and future risks associated with the remaining contamination. Data analysis shows that the current and expected future risks to human health and the environment do not pose a threat. EPA believes that remediation at FTBP1 is complete, groundwater monitoring can cease, and the groundwater plume from the FTBP1 is not an exposure risk based upon the following:

- A review of over 20 years of data shows that the plume boundaries are receding and the concentration and mass of chemicals of concern (COCs) in groundwater is decreasing.
- The plume boundary is 1,000 feet upgradient of Squaw Suukjak Sep Creek, the nearest surface water body.

- Due to the fact that the source of groundwater impacts has been completely removed, the contaminant concentrations in the plume are expected to naturally attenuate.
- No vapor intrusion from the groundwater contaminants is expected to impact receptors. No buildings are located within or downgradient of the plume and there are no plans to construct buildings in this area.
- The nearest downgradient water supply well is 1.4 miles west of the unit, and is located on Fort McCoy property.
- The downgradient Fort McCoy property boundary is 2 miles west of the unit.
- There are no completed human or ecological exposure pathways.
- For further information on AFFF used at FTBP1, see *Section VII. Ongoing Investigations Unrelated to Federal Corrective Action Requirements*.

In December 2014, EPA agreed that the groundwater monitoring at FTBP1 and CLF2 could cease based upon low contaminant levels and no human exposures. Institutional controls for FTBP1 and CLF2 are currently in place. The sites are listed on WDNR GIS registry the Wisconsin Remediation and Redevelopment Database with WI Continuing Obligations for soil and groundwater contamination. Both SWMUs have a cap maintenance requirement to ensure that there is no direct contact with the remaining soil contamination in the case of FTBP1, or contact with waste in the case of CLF2. There are also restrictions regarding future installation of any potable wells at these sites without prior WDNR approval. If the installation ever plans to change property use at either SWMU, the Army is required to obtain approval from the WDNR in advance. If such changes would change exposure potentials, the installation would be required to take necessary actions to protect human health and the environment, as approved by the WDNR.

VII. ONGOING INVESTIGATIONS UNRELATED TO FEDERAL CORRECTIVE ACTION REQUIREMENTS

These investigations are not related to corrective action conditions in the federal permit. They are included in this SB for informational purposes only, contributing to a more complete contaminant history of the impacted units. The WDNR is overseeing these investigations (working with the Department of Defense) and will ensure that public health and the environment are addressed and protected through these investigations. EPA believes that Wisconsin law is the most appropriate authority to address perfluorinated ~~chemicals compounds~~ (PFCs) at Fort McCoy.

Overview:

Aqueous Film Forming Foam (AFFF) was historically utilized at Fort McCoy's former FTBP1 and FTBP2 to extinguish fires caused by flammable liquids. Recent studies have identified health concerns associated with exposure to certain PFCs which were contained in AFFF. In particular, two PFCs have been found to cause health problems. These are perfluorooctanesulfonate (PFOS) and perfluorooctanoic acid (PFOA). In 2016, EPA established

a Health Advisory (HA) level in drinking water for combined concentrations of PFOS and PFOA of 70 parts per trillion (ppt).

In September, October, and December 2016, sampling and analysis was done at FTBP1 and FTBP2 for eight constituents that are typically found in groundwater at former fire training sites where AFFF has been used. These eight constituents are perfluorobutanoic acid (PFBA), perfluoropentanoic acid (PFPeA), perfluorohexanoic acid (PFHxA), perfluoroheptanoic acid (PFHpA), PFOA, perfluorobutanesulfonate (PFBS), perfluorohexanesulfonate (PFHxS), and PFOS. For further information on these PFCs, please see <https://www.epa.gov/ground-water-and-drinking-water/drinking-water-health-advisories-pfoa-and-pfos>.

FTBP1:

On September 6 and 7, 2016, samples were collected from 11 of the FTBP1 wells and analyzed for PFCs (Figure 3). The September 2016 results are summarized in Table 4. The data show that PFCs have been migrating in groundwater away from FTBP1. Combined concentrations of PFOS and PFOA at levels exceeding the EPA Health Advisory did not extend beyond West Thirteenth Avenue (which is on-site) in the September 2016 sampling data. However, results from the December 2016 monitoring round (Table 4) indicate that a monitoring well was impacted beyond West Thirteenth Avenue and, therefore, that the extent of impacts has not yet been defined. The difference in concentration between the September and December sampling events at monitoring well OW141 (the farthest downgradient well sampled) was 408.9 ppt. As shown in Table 4, concentration fluctuations between September and December were also reported at several other wells.

A third round of samples for PFCs was collected on August 14 and 15, 2017. Results are summarized in Table 4. The data show significant concentration fluctuations between sampling events for wells OW117, OW308, and OW141, located in the center of the groundwater plume flow path. Data collected so far have confirmed that PFC concentrations near and downgradient of the former FTBP1 are present at levels exceeding the HA level. Additional investigation work at FTBP1 will begin in late 2018.

~~No completed human health or ecological exposure pathways exist currently for AFFF at FTBP1 and these pathways are not likely to be completed in the future. In this respect, the unit is approximately 1,300 feet upgradient of Suukjak Sep Creek, the nearest downgradient drinking water well is approximately 1.4 miles west of the facility, and no non-potable wells exist close to the facility. WDNR issued a letter on May 25, 2018 requiring site investigation. If a future remedy is determined to be necessary for FTBP1 following complete definition of the nature and extent of impacts, WDNR will ensure that public health and the environment are protected.~~

Commented [WM12]: It is not appropriate to speculate on whether exposure pathways are complete until SI is completed.

FTBP2:

On October 13, 2016, groundwater samples were collected from 11 Geoprobe borings in the vicinity of former FTBP2 (Figure 4) and analyzed for PFCs. The October 2016 results are summarized in Table 5. As shown, the PFC contaminant concentration at FTBP2 showed five Geoprobe samples with combined PFOA and PFOS concentrations below the Health Advisory

(HA) level and six samples with PFC concentrations above the HA levels. No additional sampling has been done at FTBP2 since the October 2016 sampling event.

~~No completed human health or ecological exposure pathways exist currently for AFFF at FTBP2 and these pathways are not likely to be completed in the future.~~ AFFF use at FTBP2 began prior to 1982. The last time AFFF was used at FTBP2 was in 1992. Combined concentrations of PFOS and PFOA at levels exceeding the HA do not appear to extend beyond the north/south runway of the airfield and to only extend approximately 740 feet north of FTB2. This is approximately 2,400 feet south of Silver Creek. WDNR issued a letter on May 25, 2018 requiring site investigation. If a future remedy is determined to be necessary for FTBP2 following complete definition of the nature and extent of impacts, WDNR will ensure that public health and the environment are protected.

EPA believes that the sampling results indicate that all of the PFC impacts now present at the location of former FTBP2 are from FTBP3. FTBP3 is currently in use by Fort McCoy for purposes of firefighting training. It is important to note that FTBP3 did not exist at the time of the original federal permit (June, 1990) and therefore was not included as a Solid Waste Management Unit in the permit. In addition, FTBP3 has never been used for storage or disposal of hazardous wastes.

Corrective Action at FTBP1, FTBP2, and FTBP3:

WDNR maintains oversight of FTBP1, FTBP2, and FTBP3, as per the Remediation and Redevelopment Program at WDNR (January 27, 2017 and May 25, 2018 letters from Mae Willkom to Mr. James R. Hessil). The legal responsibilities of FM to investigate and restore the fire training areas are defined under Section 292.11 Wisconsin Statutes (the hazardous substances spill law), which provides information regarding investigation and cleanup of contamination. If a future remedy is determined to be necessary for the fire training areas following complete definition of the nature and extent of impacts, WDNR will ensure that public health and the environment are protected. In addition, WDNR will ensure that EPA is informed regarding the progress of the investigation.

At this time, no unacceptable exposures to human or ecological receptors has been determined although the investigations at the fire training areas ~~is~~ are ongoing. The remote location of the fire training areas relative to human receptors minimizes the risk of exposure. Long-term remedies to minimize the future risk of completion of human or ecological exposure pathways will be focused on stopping or minimizing continued groundwater impacts through product substitution, engineering or work practice controls that minimize infiltration of contamination, and property use controls. EPA reserves the right to ~~revisit this SB~~ if future data indicates potential impacts resulting in unacceptable exposures to human or ecological receptors.

Commented [WM13]: it's not clear what this implies. Is there a process for reopening this permit closure?

VIII. WDNR GIS REGISTRY WISCONSIN CONTINUING OBLIGATIONS AND LAND USE CONTROL

To ensure continued protection of public health and safety, the WDNR has placed institutional controls (ICs) on several of the 11 units listed in the RCRA Permit as a condition of closure. The

ICs will remain in place in perpetuity. These controls will be imposed through the Wisconsin GIS Registry for contaminated sites Continuing Obligations. The units have also been entered into the Fort McCoy GIS for land use control.

The Wisconsin GIS Registry program Continuing Obligations utilizes statutory authority to institute ICs that carry forward to all subsequent property owners. This The Wisconsin Remediation and Redevelopment Database is an on-line data system that is accessible to the public at any time without travel and it is updated on a daily basis. This system provides notification of the presence of contamination on all affected properties, regardless of size, with or without permission of the owner. The GIS Registry Wisconsin Continuing Obligations allows for ICs to be updated or removed without legal representation (<http://dnr.wi.gov/botw/SetUpBasicSearchForm.do>- Facility ID 642024900).

IX. PUBLIC PARTICIPATION

The "public" includes the general public and other parties (for example, public interest groups and regulatory agencies). The public may have an interest in understanding the environmental conditions at Fort McCoy as EPA considers this Class III Permit Modification. EPA may determine that other actions are appropriate at Fort McCoy based on new information or public comment. The public can be involved in this process by reviewing the documents contained in the administrative record file and submitting comments to EPA during the public comment period.

EPA is soliciting input from the community on this Class III Permit Modification. Comments on this SB (the permit modification) will be taken for 60 days. Members of the public may submit written comments to the EPA regarding the proposed remedy during the 60-day public comment period. Comments may be submitted by mail or email to:

Colleen Olsberg, Ph.D.
Environmental Scientist
U.S. Environmental Protection Agency - Region 5
Land and Chemicals Division
77 West Jackson Boulevard (LU-16J)
Chicago, IL 60604
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**FIGURE 1: LOCATION OF U.S. ARMY GARRISON - FORT McCOY
SPARTA, WISCONSIN**

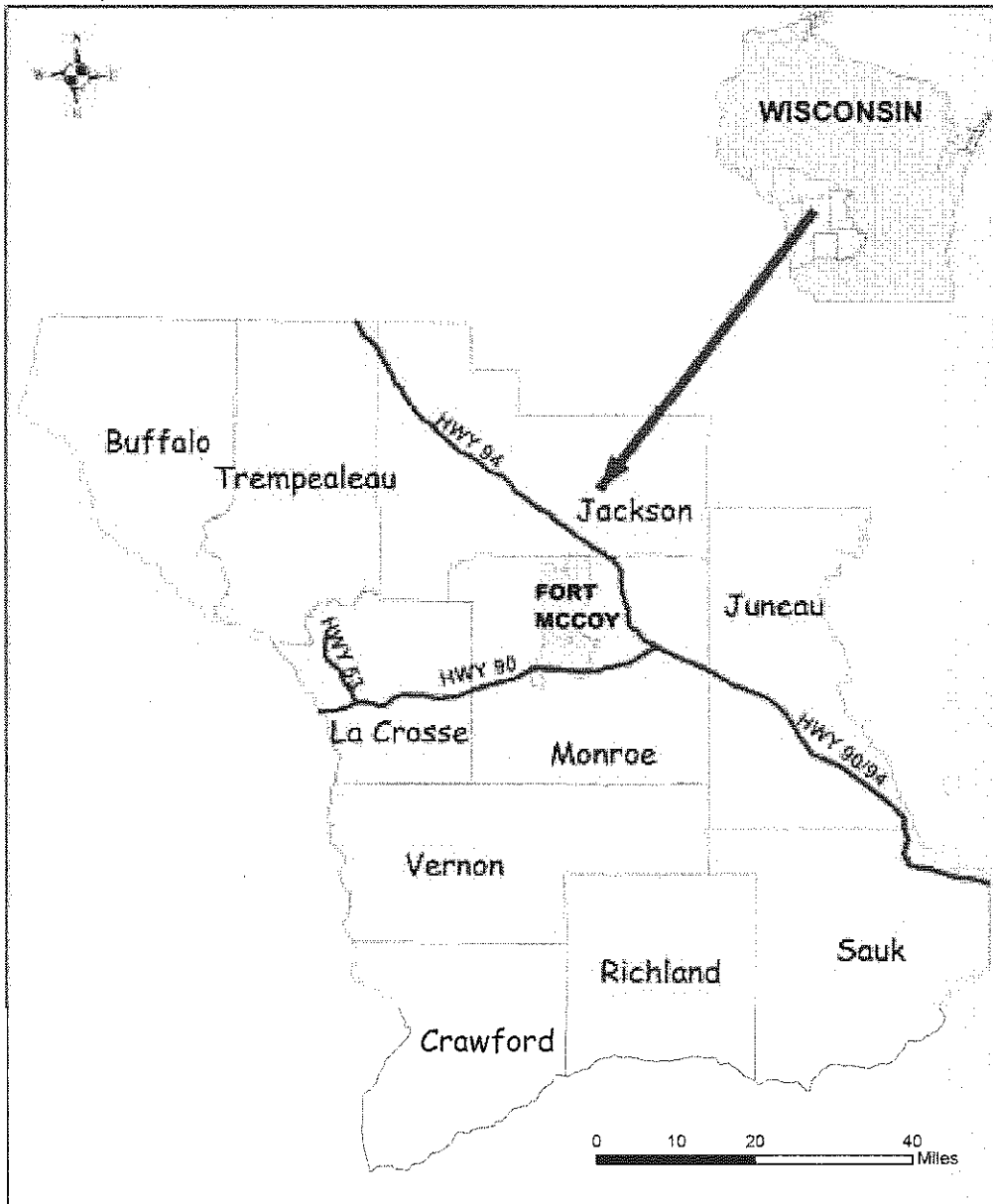


TABLE 2
SUMMARY OF ANALYTICAL RESULTS FOR FIRE TRAINING BURN PIT 1

RCRA permit Chemical of Concern	MCL (ug/L)	Sample Date	Data Range ¹ (ug/L)
Trichloroethylene	5.0	10/2012	<0.48 – 1.5J
		4/2013	<0.48 – 1.1J
		10/2013	<0.36 – 2.5
cis-1,2-DCE	70	10/2012	<0.83 – 256*
		4/2013	<0.83 – 165*
		10/2013	<0.42 – 427*
Vinyl Chloride	2.0	10/2012	<0.18 - <0.36
		4/2013	<0.18 - <0.36
		10/2013	<0.18 - <0.37
Tetrachloroethylene	5.0	10/2012	<0.45 – 7.1*
		4/2013	<0.45 – 4.2
		10/2013	<0.47 – 10.5*

¹Data Range for groundwater monitoring wells OW-116B, OW-117, OW-129B, OW-132, OW-133B, OW-134, OW-135, OW-136B, OW-137, OW-138, OW-141, OW-142, OW-143, OW-145, and OW-308.

*Elevated concentrations above listed screening levels indicate groundwater monitoring wells with closest proximity to source. Risk to receptors due to elevated concentrations is minimal due to limited access to unit. Due to the fact that there are no complete current or potential exposure pathways for humans, there is no reason to believe that the minimal risks to human health and the environment will change in the future. See **JUSTIFICATION FOR CORRECTIVE ACTION COMPLETE DETERMINATION AT FORT McCOY.**

FIGURE 2
FIRE TRAINING BURN PIT 2 AND FIRE TRAINING BURN PIT 3
GROUNDWATER WELLS SAMPLED OCTOBER 2016

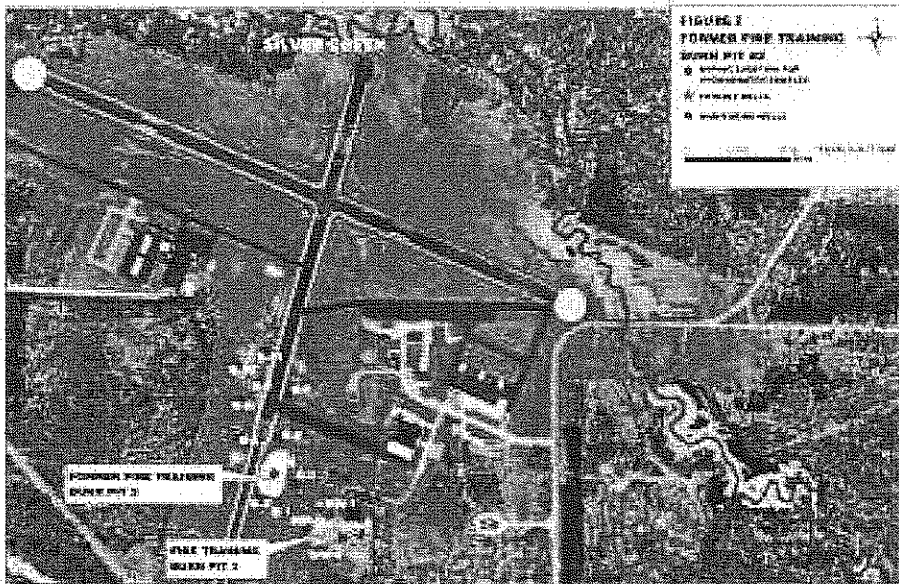


TABLE 3
SUMMARY OF ANALYTICAL RESULTS FOR CLOSED LANDFILL 2

RCRA Permit Chemical of Concern	NR 140 ¹ Enf Std (ug/L)	MCL (ug/L)	Sample Date	Data Range ³ (ug/L)
Antimony	6.0	6.0	10/15/2012	0.16J - 6.20*
			4/8/2013	0.17J - 9.20*
			10/21/2013	0.23J - 9.50*
Cadmium	5.0	5.0	10/15/2012	<0.13 - 0.57J
			4/8/2013	<0.13 - 0.18J
			10/21/2013	0.073J - 1.10
Iron	0.3	NV ²	10/15/2012	<0.0104 - 12.50*
			4/8/2013	0.0221 - 3.52*
			10/21/2013	0.0391J - 1.86*
Lead	15	15	10/15/2012	<0.061 - 1.100
			4/8/2013	<0.061 - 0.78J
			10/21/2013	<0.064 - 0.84J
Manganese	300	NV ²	10/15/2012	2.8 - 194.0
			4/8/2013	1.3 - 70.3
			10/21/2013	4.7 - 343.0*

¹NR 140 Enforcement Standard for Wisconsin Department of Natural Resources

²No Value

³Data Range for groundwater monitoring wells OW-101, OW-102, OW-103, OW-121, and OW-122.

*Elevated concentrations above listed screening levels indicate groundwater monitoring wells with closest proximity to source. Risk to receptors due to elevated concentrations is minimal due to limited access to unit. Due to the fact that the waste is properly covered at CLF2, there is no reason to believe that the minimal risks to human health and the environment will change in the future. See **JUSTIFICATION FOR CORRECTIVE ACTION COMPLETE DETERMINATION AT FORT McCOY.**

Commented [WM14]: There are no access limitations at CLF2.

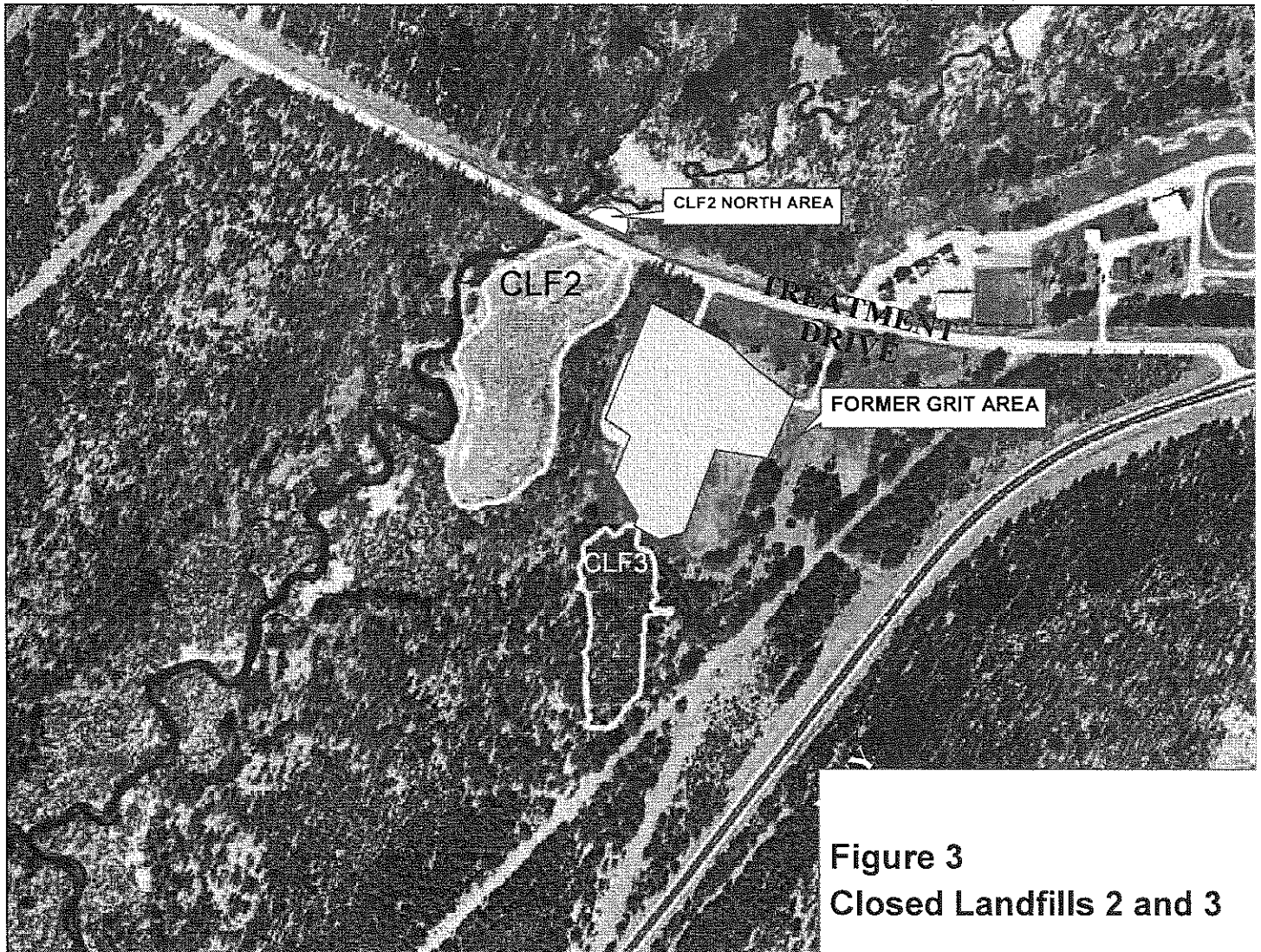


Figure 3
Closed Landfills 2 and 3

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TABLE 4
FIRE TRAINING BURN PIT 1
PFOA AND PFOS RESULTS

Well ID	ELEVATION OF MEASURING POINT (MSL ¹)	DEPTH TO WATER			PARAMETER						RI
					PFOA (ug/L)			PFOS (ug/L)			
		Sep 2016	Dec 2016	Aug 2017	Sep 2016	Dec 2016	Aug 2017	Sep 2016	Dec 2016	Aug 2017	
P-133A	891.22	12.19	12.58	10.63	0.0026	0.0049	0.0038	0.0055	0.0048	0.0029	C
OW-133B	891.12	12.11	12.49	10.53	0.0096	0.0086	0.010	0.044	0.085	0.043	C
OW-133B (DUP)	891.12	12.11	12.49	10.53	0.0055	0.009	0.011	0.034	0.094	0.048	C
P-134A	891.78	12.27	12.71	10.74	<0.00062	<0.00073	<0.00068	0.0011	0.0053	<0.0012	C
OW-134	892.19	12.75	13.19	11.19	0.0019	0.0020	0.0055	0.220	0.150	0.095	C
OW-137	891.45	14.48	14.89	13.12	0.013	0.0058	0.012	0.190	0.130	0.230	C
OW-141	889.10	15.95	16.38	14.70	<0.00064	0.032	0.0025	0.0031	0.380	0.021	C
P-308A	891.40	12.70	13.08	11.16	0.0063	0.0027	0.0021	0.0077	0.0019	0.0110	C
OW-308	891.57	12.79	13.18	11.25	0.0040	0.0400	0.018	0.160	6.000	0.790	C
OW-117	893.55	12.25	12.63	9.48	0.510	0.920	0.0093	23.000	31.000	0.220	2
OW-136B	892.17	11.81	12.21	NS	0.044	0.067	NS	1.400	1.900	NS	
OW-142	888.47	NS	NS	14.98	NS	NS	0.00069	NS	NS	0.019	
OW-145	898.14	14.51	14.84	12.59	0.150	0.0250	0.150	0.029	0.0360	0.140	C
Equipment Blank					<0.00065	<0.00076	<0.00068	0.0017	<0.0013	<0.0012	C
USEPA HA ²											C
Mean Groundwater Elevation											

Notes:

¹MSL= Mean Sea Level

²USEPA HA: Health Advisory for PFOA + PFOS and is 70 parts per trillion = 0.070 (µg/L).

Bold results show exceedances of USEPA HA.

NS = Not Sampled.

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TABLE 5
PFC SAMPLING RESULTS FOR FIRE TRAINING BURN PITS 2 AND
(October 2016)

SAMPLING POINT	PERFLUORINATED COMPOUNDS (ug/L)					
	PFBA	PFHxA	PFHpA	PFBS	PFPeA	PFHxI
FIRE TRAINING BURN PIT 2 (10/13/16 and 10/14/16)						
B-1	0.0062	0.018	0.0083	0.0037	0.014	0.088
B-2	0.0065	0.010	0.0066	0.0041	0.010	0.036
B-3	0.100	0.480	0.130	0.230	0.210	4.400
B-4	0.0076	0.012	0.012	0.0025	0.0093	0.070
B-4 (DUP)	0.0074	0.012	0.012	0.0026	0.0092	0.070
B-5	0.330	0.890	1.400	0.120	0.730	7.400
B-6	0.0028	< 0.00077	0.00062	< 0.00090	0.0018	0.0018
B-7	0.0017	0.0015	0.0018	0.0015	0.0012	0.044
B-8	0.00058	< 0.00082	< 0.00083	0.001	0.0019	< 0.00090
B-9	0.0064	0.0044	0.0040	< 0.00089	0.0029	0.0037
B-10	0.00046	< 0.00078	< 0.00079	< 0.00091	< 0.00098	0.0010
B-11	0.0058	0.0036	0.0016	0.0010	0.0040	0.0036
FIRE TRAINING BURN PIT 3 (9/6/2016)						
MW-1R	0.094	0.250	0.280	0.035	0.390	1.200
MW-1R (DUP)	0.098	0.260	0.300	0.042	0.420	1.300
MW-2R	1.400	4.900	1.200	0.380	5.300	7.800
MW-3R	0.750	2.000	0.530	1.200	3.000	2.600
MW-4R	0.200	1.200	0.230	0.250	0.700	5.500
USEPA PROVISIONAL HEALTH ADVISORY (ug/L)	NS	NS	NS	NS	NS	NS

¹This standard is for combined PFOA and PFOS.
Bold results show exceedances of USEPA HA.
NS = Not Sampled

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